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Brigadier General Robert F. Molinelli
Army Aviation Officer
ODCSOPS, Headquarters,
Department of the Army

Major General Bobby J. Maddox
Commander
U.S. Army Aviation Center
Fort Rucker, Alabama

Brigadier General Charles E. Teeter
Deputy Commander
U.S. Army Aviation Center
Fort Rucker, Alabama

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Cover: **Depicts Army Aviation employed in the combined arms team. Read the major areas charted by AVNEC -83—force design, doctrine and how to fight. Story begins on page 2. Illustration by Fred Martin.**

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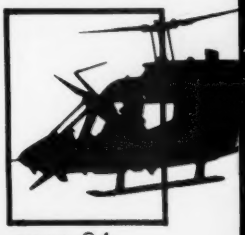

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Richard K. Tierney
Editor

Honorable John O. Marsh Jr.
Secretary of the Army

The mission of the *U.S. Army Aviation Digest* (USPS 415-350) is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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AVNEC 1983 in the words of the keynote speaker, LTG Carl E. Vuono, commanding general, U.S. Army Combined Arms Center, served to "chart the course for Army Aviation." Authors of the article, MAJ Marc Snyder and CPT Rick Hancock, report the milestones achieved in validating force design, integration training, doctrinal manuals and arriving at a consensus of how to fight. You'll learn how aviation may be employed in high, mid-intensity and contingency missions.

Through his vivid imagination, MAJ Peter Bartosch places us in the 21st century flying the successor to the AH-64 and AHIP. "Aviation Training For The Future" reminds us that though technology has changed our weaponry and modes of transportation, the air cavalry mission still has much in common with the horse cavalry of a century ago.

Stress is a factor that influences all of us to some degree, regardless of its source. CW3 Michael Novosel Jr., the author of "The Stressed Aviator," gives us clues to look for *and* solutions to decrease the tensions that burden us. Aviators distracted or fatigued due to inordinate stress are unsafe in the air. Devote a few minutes to read this worthwhile article and increase your awareness of stress.

"School Model '83...at Ft. Rucker," is about the extensive reorganization effective 1 October 1983 to elevate instruction and doctrine development to first and second mission priorities within TRADOC. Mr. H.L. Flowers explains the new alignment of organizations and their roles, including the new school structure for Army Aviation as a separate branch.

CW3 Charles Murphy tells of the imaginative ideas in the 3-5 Cavalry that solved the problems of effective ordnance delivery at night. "9th CBAA—Night Vision Goggles Combat Effectiveness," explains the integration of the NVG and HSS with emphasis on the need for the helmet to be a stable sighting platform.

I encourage you to read the DES offering this month. "Timeliness In Army Aviation" is extremely important. As a member of the combined arms team, we must synchronize our effort with the efforts of the others on the team to produce the winning combination. Being at the appointed place and time are two basic steps of discipline that individuals and units must take to pursue victory.

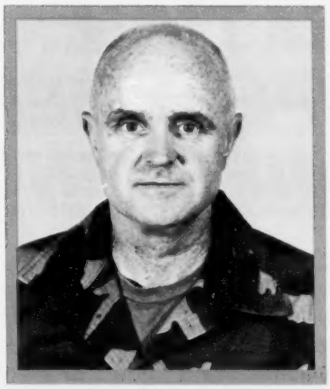
Safely operating the scout helicopter in combat will leave the aviator little time for other tasks; for this reason, "The Aeroscout Observer Needs Better Training" according to CW3 Michael Wyman. The cavalry scout school concentrates on ground observer tasks and SQTs don't include airborne skills.

"The AirLand Battle: A Winning Combination" authored by LTC John Heslin, suggests changes in priorities and organizations of the combined arms to attack the enemy's weakness and create further vulnerable targets we can exploit.

CPT Kevin Scherrer cautions us to start "brainstorming" for ways the undergunned UH-1s and other older model friendly helicopters operating near the FLOT can survive. "Pigs and Rice In The OK Corral" offers some concepts and invites your suggestions so that we might develop tactics that will improve survivability in air-to-air defense.

The articles in this issue are excellent and thought-provoking. I hope you read each of them and further enrich your aviation professionalism.

Happy New Year!



Major General Bobby J. Maddox
Commander, U. S. Army Aviation Center
Fort Rucker, AL

AVIATION EMPLOYMENT CONFERENCE

Major Marc Snyder
and
Captain Rick Hancock

"WHAT A GREAT day for the Army! We are making history here today as we chart the course for Army Aviation!" These stirring remarks were made by Lieutenant General Carl E. Vuono, commanding general, U.S. Army Combined Arms Center, in his keynote address which marked the beginning of the 1983 Army Aviation Employment Conference (AVNEC-83).

AVNEC-83 was hosted by the U.S. Army Aviation Center on 12 to 14 October 1983. The conference was attended by representatives from all levels of the Army and Army Aviation—users, developers and decisionmakers—from Department of the Army, U.S. Army Europe, continental United States Divisions, U.S. Army Forces Command, U.S. Army Training and Doctrine Command (TRADOC), Korea and nonaviation division commanders.

AVNEC '83

Historical Perspective

A first point to note prior to an assessment of AVNEC-83 is to provide an anthology of events within the developmental process. AVNEC was introduced in 1978. This general officer conference included representatives from all levels of the Army and Army Aviation. The conferees sought to comprehensively evaluate the needs of Army Aviation in four specific areas:

- Standardization/Interoperability (June 1978 *Aviation Digest*).
- Army Aviation "How to Fight" Offense (July 1978 *Aviation Digest*).
- Army Aviation "How to Fight" Defense (August 1978 *Aviation Digest*).
- Army Aviation Personnel and Training Problems (September 1978 *Aviation Digest*).

A series of events took place in 1982 which aroused widespread concern about issues critical to Army Aviation and specifically addressed how deficiencies may be corrected. Those events were the Army Aviation Mission Area Analysis (AAMAA) in January, the Army Aviation Systems Program Review (AASPR) in March and the Army Aviation Development Plan (AADP) in September.

The AAMAA (April 1982 *Aviation Digest*) was a 1-year effort that identified deficiencies which diminish the capability of Army Aviation to fight at peak efficiency against the Threat and identified ways to correct these deficiencies.

The AASPR (June 1982 *Aviation Digest*) was a forum comprised of the Army's senior leadership—there were 51 general officers in attendance, including half of our serving four star

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generals. Four implicit premises considered were:

- Concepts, Doctrine and Tactics (July 1982 *Aviation Digest).*
- Training (October 1982 *Aviation Digest).*
- Organization and Force Structure (September 1982 *Aviation Digest).*
- Materiel (October 1982 *Aviation Digest).*

The AADP (March 1983 *Aviation Digest)* addressed each AAMAA recommended corrective action redefined by the AASPR. This plan is now used as a road map by combat and training developers as well as users who must apply the corrective actions.

AVNEC Objectives

Once the major deficient areas articulated by the AAMAA, AASPR and the AADP had been identified, the next logical step was AVNEC-83. The primary thrust of the conference was threefold:

- Validate Force Design.
- Validate Doctrinal Manuals.
- Reach Consensus on "How to Fight."

Methodology

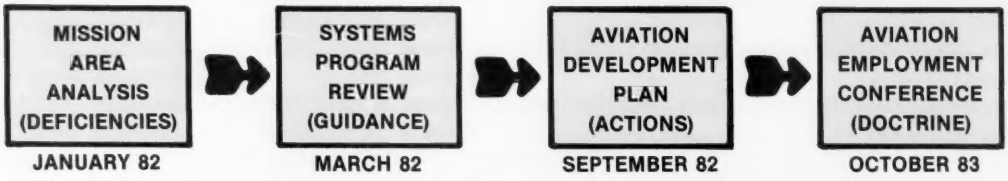
Combined arms employment scenarios were used as the methodology for addressing and deciding the issues on how Army Aviation should be employed in high- and mid-intensity conflicts and for contingency missions. Employment doctrine was based on FM 100-5, "Operations." Mission analysis, aviation requirements and battle plan integration were based on the military decisionmaking process described in FM 101-5, "Staff Officers' Field Manual: Staff Organization and Procedure."

Preliminary Planning

To set the proper stage for AVNEC-83, a pre-AVNEC workshop (15 to 18 August), a retired general officer briefing (1 September) and an Army aviator general officer briefing (12 September) were held at Ft. Rucker. The significant highlights are identified below:

- The pre-AVNEC workshop was comprised of 49 representatives—ground and aviation unit commanders and staff officers—from major commands throughout the Army. The attendees considered how Army Aviation should be employed in combined arms scenarios, and they formulated recommendations for presentation during the actual conference.
- The retired general officer briefing consisted of workshop panel briefings. The attendees provided the Aviation Center with the benefit of their considerable technical expertise and combat experience.
- The Army aviator general officer briefing encompassed the same workshop panel briefings that were given to the retired general officers.

AVIATION MILESTONES



This presentation prepared the general officers for their participation in the conference and afforded the Aviation Center an opportunity to gain their guidance and support before the actual conference.

Nature and Scope of Conference Procedures

Presentations covering the Threat, Army-86 Combat Aviation Brigade (CAB) (also known as Cavalry Brigade, Air Attack), Army Aviation Transition Proposal, Army Aviation Modernization Plan, Aviation Branch Implementation Plan, Aviation Logistics and the proposed combined arms employment scenarios set the stage for panel discussions.

Three panels were organized: one worked a scenario for the employment of Army Aviation in a high-intensity conflict (Europe); one worked a mid-intensity conflict scenario (Southwest Asia); and one panel worked a contingency mission scenario (a third world country). Each panel was instructed to analyze its assigned scenario, to include common conclusion statements reached during pre-AVNEC efforts.

Common Conclusions

The remainder of the conference was devoted to formulating conclusions and recommendations on the issues. The results were presented and discussed on the second day. Consensus from the three panels was then established regarding these conclusion statements. The findings are presented below:

- ***The CAB headquarters staff is sufficient to command and control ground units.*** All panels agreed that the CAB headquarters staff is adequate to control organic and other ground units and to handle most missions that conceivably could be assigned to the brigade. Liaison, long-distance communications, logistical support and extended around-the-clock operations are viewed as weaknesses in the present organization.

- ***The CAB is a very flexible organization with the capability to fight in more than one direction at a time.*** The inference that the CAB is specifically designed to fight in multiple directions is incorrect. In some situations, the brigade might handle muliple missions at once (for example, it could screen, perform rear area combat operations (RACO), and support another brigade in combination). The battalion staffs provide additional planning and control capabilities that augment the brigade staff. If the CAB's command, control and communications resources are in danger of becoming overextended, other measures (for example, operational control (OPCON)) may resolve command problems.

- ***The current Division-86 CAB organization is the best available structure considering realities.*** The current CAB organization has been tested and should be implemented without delay. Once fielded, modifications may be required to fine-tune the organization within the division. Some of the issues to be resolved after the CABs are established include the air-ground mix, medium-lift assets, austerity of air cavalry troop assets, mission statement for the cavalry squadron and placement of the transportation aviation maintenance company (TAMC) within the CAB.

- ***The CAB is capable of operating as a maneuver unit.*** The CAB is certainly capable of operating as a maneuver unit either pure or task organized. The CAB augmented with ground forces is synergistic, although augmentation with ground forces reduces aviation support across the division, and inhibits speed of movement. The key to success is forcing the enemy to fight in two directions at once.

- ***The best command relationship for Aviation units is OPCON.*** Panel members did not reach unanimity on this issue. The discussion of OPCON versus direct support was lengthy. OPCON was considered more appropriate for the employment of corps assets, whereas division CAB resources functioned well in a direct support role. Brigade commanders should not expect to receive a slice of aviation as they do other elements; for example, signal and engineer. In reality, the appropriate command relationship will be determined by mission, enemy, terrain and weather, troops available and time (METT-T).

- ***Fielding a limited self-defense air-to-air capability is critical.*** The term "limited" does not adequately address the need for self-defense air-to-air capabilities. It is more accurate to say that air-to-air options should be provided as soon as possible. The self-defense capability will enhance the ability to carry out all missions. Aircrew training is a new requirement, and there are voids in air-to-air tactics and evasion.

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• ***Nuclear, biological and chemical (NBC) equipment is incompatible with current aircraft systems.*** NBC equipment requires improvement to be made fully compatible with current aircraft systems. The current NBC equipment does not provide in-flight chemical detection or a fully acceptable decontamination capability for aviation equipment.

High Intensity—Conclusions

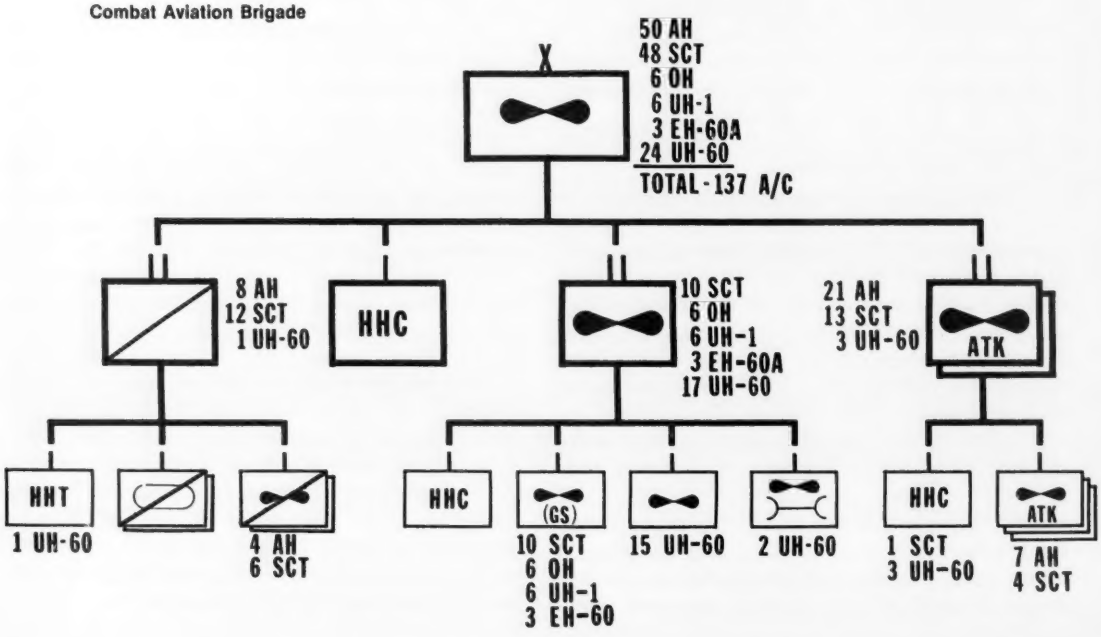
The high-intensity scenario was adaped from a TRADOC approved scenario based on a European conflict. The high-intensity panel's conclusions are cited below:

• ***The CAB is a principal member of the combined arms team.*** The mission potential of the CAB makes it a principal member of the combined arms team, adding new dimensions that can dramatically increase the combat power of the division and corps.

• ***The CAB provides the division commander a flexible and highly mobile force that can be used to mass combat power at the decisive time and place on the battlefield for either maneuver or support.*** Maneuver and direct support are highly appropriate ways to apply the combat power of the CAB. The CAB provides the flexibility to mass combat power to an unprecedented degree.

• ***The CAB provides the division commander with a fourth planning brigade headquarters.*** The staff of the CAB provides adequate capability to serve as a fourth planning brigade headquarters. It provides the same planning capability at corps level.

• ***The CAB is effective as a maneuver brigade either pure or under special circumstances when***



augmented with ground forces. The CAB is the most maneuverable of the four brigades in the division. It can function as a fully integrated combat element, accepting control of armor and infantry, while supported by divisional combat support and combat service support elements.

• *Given constraints, the current Army-86 CAB organization is the best structure for Army Aviation.* The current organization has been tested at Ft. Lewis, WA, and is analogous to previous organizations. These facts diminish the risks associated with fielding. The CAB should be fielded without further delay, and the plan to field CAB through 1989 should be accelerated.

Mid-Intensity—Conclusions

The mid-intensity Southwest Asia scenario was based on the Mideast III Scenario issued by TRADOC. The panel examined all the relationships and then singled out the most significant alternatives. Panel conclusions were as follows:

• *Combat aviation employment considerations differ little in the mid-high intensity conflict.* Parity in nuclear capability decreases the likelihood that nuclear weapons would be employed by either side. This increases the probability that chemical weapons would be used.

• *Priority missions for corps attack assets are corps covering force and deep attack operations. Other missions are RACO and support of committed divisions. Reserve is appropriate.* Mission priority is determined by METT-T.

• *Aircraft survivability is a universal problem but is most acute for special electronic mission aircraft (SEMA).* Based on the flight envelope and flight patterns, SEMA are more vulnerable than any other mission type. Electronic warfare doctrine does not exist.

• *Liaison officers (LO) are vital, but they should not be unit commanders.* Institutional training must be established to train LOs. This training must not be grade restricted; that is, all aviators must be trained to perform these duties.

• *The TAMC is located to the rear and out of the fight but under the command and control of the CAB commander.* The panel was equally split on this issue. To provide aviation intermediate maintenance support to the CAB, the TAMC must be located 80 to 90 kilometers behind the forward line of own troops and must move infrequently. If it is in the CAB, it should be upgraded to a forward support battalion with an appropriate division support command slice and be commanded by a lieutenant colonel. When the user is responsible for his own maintenance, the maintenance section is more responsive.

• *The Attack Helicopter Battalion normally is employed as a unit, but it can be task organized with other aviation elements.* The small size of attack units dictates that they not be piecemealed out.

• *The CAB is ideal for the conduct of RACO.* The division G3 is responsible for developing the rear area security plan in coordination with division support command and CAB commanders. The deputy division commander should not routinely be tied down to this mission.

• *Attack helicopters are not the only combat units in the CAB.* Stereotypical classification of "supporters" and "fighters" creates an undesirable class system which is dysfunctional. Commanders at all levels must instill a team spirit within the unit which emphasizes equality of all participants. If stereotyping is allowed to prevail, it will become a self-fulfilling prophecy.

Contingency—Conclusions

The Contingency Mission Scenario was developed by the Scenario Oriented Recurring Evaluation System (SCORES) Branch, Directorate of Combat Developments, Ft. Rucker, AL. It was not a derivative of any standard scenario and used a fictitious geographic location, a generic threat and imaginary U.S. forces. Panel conclusions were as follows:

• *When CAB is conducting offensive operations and/or missions, RACO involvement should be limited.* Only so many missions can be handled by a commander and his staff.

• *The CAB is more capable of attacking in multiple and/or opposite directions than conventional brigades.* The CAB is a very flexible organization with the capability to fight in more than one direction at a time. It is not correct to say that the CAB is specifically designed to fight in multiple directions. The degree of difficulty will depend on the parameters of the operation.

• *The cavalry squadron, instead of working directly for the division to provide flank security in the traditional relationship, may remain under the control of the CAB headquarters.* To enhance the cavalry squadron's effectiveness and to en-

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sure it receives immediate support when engaged by the enemy, many tactical situations may dictate that it remain under the control of the CAB headquarters.

Uncertain Functions and Coordination

Other issues discussed during the wrap-up session require additional action and consideration and may involve outside agencies. These and other issues, which emerge during review of the consensus documents, will be included in the executive summary. Three significant points were made during this session:

- The CAB must be put into the force structure immediately.
- FM 1-100, "Combat Aviation Operations," must be finished without delay.
- Air-to-air systems and doctrine are needed now.

Summary and Evaluation

In 1982 we celebrated the 40th Anniversary of Army Aviation. Nineteen eighty-three was a banner year in the history of Army Aviation. With the establishment of an Aviation Branch, Army Aviation is now formally a full partner on the combined arms team.

We begin this new era for Army Aviation just as the Army is implementing AirLand Battle doctrine. Thus, AVNEC-83 was a timely and valuable experience for the Army Aviation community. The conference emphasized those critical tasks and responsibilities that must be accomplished to realize the vast potential of Army Aviation's contribution to the combined arms team. The linchpin for all of the most critical tasks—force integration, training, and becoming a separate and distinct combat arm—is aviation doctrine.

The Aviation Center has assumed the lead in AirLand Battle doctrine and accepts the challenge that goes with it. AVNEC-83 provided the conceptual framework for developing Aviation doctrine to train and educate the Army on our proper role and capability. We are determined to reflect Army Aviation's full capabilities in our doctrine. We can and will assert Army Aviation's unique mobility and firepower in such a manner that maneuver will be given a position of dominance on the battlefield.

ABOUT THE AUTHORS

Major Marc Snyder

Major Marc Snyder, Field Artillery, is currently serving as the Senior Plans/Programing Officer with the Directorate of Training and Doctrine, Ft. Rucker, AL. He is a graduate of the Advanced Resource Management Course at Syracuse University and is a member of the American Society of Military Comptrollers. Major Snyder has served in a variety of financial staff positions at the Aviation Center as well as operational Field Artillery assignments including command and primary staff positions.

Captain Rick Hancock, Aviation, is currently serving as an operations officer in the Directorate of Training and Doctrine, Ft. Rucker, AL. He has previously commanded two separate companies in the prototype Division-86 Combat Aviation Brigade at Ft. Lewis, WA.

Captain Rick Hancock

Aviation Training For The Future

Major Peter M. Bartosch
Directorate of Training and Doctrine
U.S. Army Aviation Center
Fort Rucker, AL

The views expressed in this article are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

THE CAVALRY SCOUTS' mission has not changed much through the years. The weapons and mode of transportation have changed, but the planning, pre- and post-operations and mission have remained pretty much intact. The soldiers of the horse cavalry and the air cavalry all have had many things in common. Reconnaissance, screen, security, guard, economy of force, all have been in the vocabulary for more than a century.

Training hasn't changed much through the years either. It was thought that nothing can take the place of "hands on" practice until the advent of the relatively new simulation devices. Simulation has gradually taken a larger share of the training burden. It is estimated that for the Army's next generation of aircraft (the Joint Vertical Experimental (JVX 1990)), training will be 90 percent simulation.

What does the future hold for technology in simulation? Shall wars be fought with computers? Perhaps the following scenario may give some insight.

The year is now 2025, Ft. Campbell, KY. The cavalry soldier is receiving his briefing from the opertions officer. He jots down the word of the day and call sign data that will be entered into his central processing unit. He pays particular attention to the threat portion of the briefing. Later he will have to tell the crewchief the munitions mix he wants loaded on his craft.

Briefing finished, he walks out to his charge, helmet bag in one hand and a small metal box in the other. He climbs into the dark, lifeless cockpit, carefully places the helmet on his head and plugs in a small connector attached to a fiber optic cable. He opens his metal box and takes out a miniature cassette (voice recognition tape) which he plugs into the center console of the craft. He removes another tape containing the crypto variables, communications-electronics operation instructions, terrain map and mission plots for the day and plugs them into another slot in the center console. He flips a switch and in front of him a visual display prompts him to enter the words of the day for the supporting units he will be working with. From his little "crib sheet" he reads out loud, for the central processor, the words for the six units he will need to coordinate with during the mission.

Next he initiates the start sequence. Momentarily the cockpit lights up with a 270 degree panoramic view of the airfield. Finally he plugs in two more fiber optic cables into his pressurized suit. These sensors provide touch sensitive (tactile) cues as well as measure

the soldier's vital signs which will be saved on the flight data recorder.

Takeoff clearance received, our soldier is joined by two stick mates. The flight departs en route to the release point (RP) where it will disperse to assigned areas. The mission: economy of force for the 2d Armored Cavalry Regiment.

Carefully monitoring his machine as it flawlessly flies the nap-of-the-earth route to the RP, our soldier ponders what may be in store for him today. He is hoping that the enemy's "neutron beam directed" weapons are not deployed in his area of operation. At the RP the flight separates, each craft covering avenues of approach in a 3 km sector. Their orders are to delay the enemy in order to "buy time" for the rest of the regiment as it maneuvers to new positions.

The sensor systems carefully scan the horizon for telltale signs of movement. Suddenly, an alert! The optical sensor has picked up an object at 5,000 meters but has not identified it. The IFF (identification friend or foe) code is negative but not enough signature is available to consider it enemy as yet. The soldier maneuvers his craft to a defilade position on a higher piece of ground. The optical sensor has again picked up the object: range 4,900 meters. He switches his sensors from wide scan to narrow scan which boosts the power to search the area of the alert. The infrared (IR) sensor has now picked up the image and target data is being displayed on the screen: *"Hind-J, 4,600 meters, grid MF 69543886, moving 30 km/hr heading 265 degrees, engage with 'terrain fire'."*

The soldier quickly finds the word of the day on his screen for the terrain fire unit supporting him and presses the send button. In 1.5 seconds an *"OK"* is displayed indicating that the message was received. Our soldier quickly reverts all sensors back to the wide scan mode to look for other targets. For what seems like an eternity the message finally comes across his screen. *"Round on the way, 55 seconds to impact."*

Our soldier raises the craft just above defilade position and fires a short burst of his "particle beam designator" at the target, then quickly returns to a concealed mode to move off to another observation point. Nearly a minute later a bright flash is viewed on his IR sensor indicating the impact of the terrain fire weapon on the Hind-J. In the meantime, however, multiple targets have been picked up by the sensors and the display is full of a prioritized list of engagements. Our soldier is frantically handing these targets off to his supporting units.

The *OKs* are coming regularly but the *round on the way* displays are becoming increasingly delayed. The soldier's stick mates are having similar activity. After a few minutes another sensor has detected the presence of enemy scanning equipment. Our soldier has been detected. It is time to move to a fall back position. He programs the navigation unit to fly the craft to fall back position #1. But before he engages the command, he raises up one more time to punch off a "beam rider" at a T-102 only 2,000 meters away. As soon as the missile leaves the rail, the earth around the craft virtually erupts with enemy indirect fire. The programed navigation unit is engaged and the craft limps out of the area.

The damage has been done, however, a 33 mm round has put a gaping hole in the control surface. The vibration is too severe for the automatic systems to control the craft. The soldier must take over manually. Tactile sensors attached to the soldier indicate malfunctions of other systems on the machine. The decision is made to get as far to the rear as possible before the *"land immediately"* alarm is sounded, indicating that total loss of control is imminent. He presses the Mayday alarm which transmits a constant encoded Mayday and updated position as a marker for ensuing search and rescue parties. The vibrations are increasing in intensity until finally the *land immediately* warning is sounded. The panoramic display begins to flicker, a clear area to put the machine down is just up ahead. Once the deceleration is initiated, the change in load reduces the vibration and the craft comes to rest on a sloping furrowed field.

Suddenly the panoramic display is extinguished. All systems begin to wind down and the cockpit door is opened. In the doorway a technician, garbed in white smock with headset festooned around his neck greets the soldier and points to the debriefing room on the other side of the building.

Our soldier releases his choke hold on the controls and wipes the sweat from his forehead. He removes

the tapes from the center console, unplugs his helmet and sensors and makes his way to the debriefing. He knows that he should have never made the last engagement, that once he received the enemy detection alert his position was compromised and he should have vacated the area at all costs. His primary mission was to delay the enemy, not to destroy him. The score is six enemy vehicles destroyed to one "Aquinas," not a good ratio.

The battlefield in this scenario was near the little town of Rotz in the province of Bavaria in West Germany. Although our cavalry soldier was in Kentucky, the Aquinas aircraft was actually flying in Germany. It was a remotely piloted vehicle with a jamproof control communications satellite link to Ft. Campbell and a battlefield communications link to the supporting units near Rotz.

The particle beam technology has replaced lasers in detecting, ranging and ordnance. The beam rider missile has replaced the HELLFIRE and the Aquinas aircraft has replaced the AH-64 and AHIP (Army Helicopter Improvement Program).

Our soldier is the aviator of the future and the United States could have been at war. To the aviator, it is difficult to tell the difference. Except for the lack of burning hulks that would have dotted the countryside, the training replicates war conditions to a tee. You see, in the desire to make simulation more and more realistic, we have found a way to merge simulators and the machine. We have come almost full circle starting from training in the aircraft exclusively, to a mix of simulators and aircraft and finally to flying simulators which control an aircraft.

The vocabulary has not changed much nor have the attributes of a successful aviator; skill, knowledge, preparation and daring are all premium requisites of the pilot in the future. There is one significant difference in our scenario which separates the aviator of the future from the present. Have you detected it? That's right—death. The expense of the technology and the cost of training an individual to be literally plugged into a machine as an integral part, has made it necessary to remove the man from the hostile environment. The risk of death has been eliminated; with it, the anxieties and inhibitions that cause accidents and needless injury.

The goal of perfectly replicating the battlefield in order to train our aviators may be farfetched, but with the advances in technology seen over the last two decades it is certainly food for thought.

NEW CORRESPONDENCE COURSE

Enrollment for a new corrspondence course, Rotary Wing Aviator Refresher Course (J42), being offered by the U.S. Army Aviation Center, will be accepted after 1 January 1984. The course consists of 9 subcourses totaling 62 credit hours: Review and General Description of UH-1 Aircraft, UH-1 Aircraft Systems, UH-1 Performance Planning, Radio Navigation, DOD FLIP Review, Aircraft Survivability Equipment, Threat and Response, Map Interpretation Terrain Analysis Course and Tactical Instrument Procedures.

Course objective is to provide aviation academic refresher training in preparation for attending the Rotary Wing Refresher Training Course (2C-F31) at the Aviation Center. The UH-1H aircraft is the base aircraft for this course. The correspondence course cannot be taken in lieu of the resident course.

Enrollment is open to commissioned or warrant officers or Department of Army civilians who possess an Army rotary wing designation in the UH-1 aircraft.

To enroll, send completed DA Form 145 to the Army Institute for Professional Development. U.S. Army Training Support Center, Newport News, VA 23628.

The Stressed Aviator

CW3 Michael J. Novosel Jr.
HHC, 2d Avn Bn
APO San Francisco

The author was assigned to the Department of Flight Training, U.S. Army Aviation Center, Ft. Rucker, AL, when he wrote this article.

STRESS CAUSES FATIGUE! What kind of stresses are you exposed to? Do you smoke? Do you take night classes? Do you keep late hours? Were you divorced in the past 6 months? Did you have a loss of a loved one this year? Is it time for your AAPART (annual aviator proficiency and readiness test)? How is your childrens' health? Do you spend a lot of time at the job? Do you have a regular physical training program? Do you eat regular meals? How about that car payment? Is sleeping on the couch getting you down?

As you can see, we are all exposed to stresses of one kind or another. If you read any accident report, you will find that the answer to many of the questions above is *yes*. If you can answer *yes* to these, then you are the stressed aviator.

You say, "So what? That's the way it is."

Well, consider the lives of those entrusted to you. Are their families going to miss them when you hit a mountain or misjudge your altitude during your cushioning pitch after an engine failure?

The many things that cause accidents can be basically summed up as distractions. If your mind isn't completely on your job while you are flying, then you may be an accident waiting to happen. Did you know that most of the aircraft lost since the beginning of aviation have been due to pilot error—and that pilot error comes from being distracted—and that distractions come from being stressed?

Now that we know what we are up against, let's see if we can think of things to do.

- **We can get a proper amount of rest.** In the field, try sitting down while you get your mission briefing. When not on a mission or planning a mission or taking care of duties, try stretching out and reading a book. In other words, try getting your mind off the mission and the related conditions as often as you can. Reading a good novel is good therapy. If the time comes to relax, take it!
- **Eat a well balanced diet.** Believe it or not, Cs (C-rations) are full of needed nutrients. Most units do feed hot chow at least one meal a day. Someone should always be available to ensure that meals are saved for you while you are out flying. If not, then make sure the commander appoints someone.
- **Exercise!** By exercise I mean *individual* exercise. Group sports are fun, and good for your body, but it is the group goals and objectives

that are foremost in your mind. On the other hand, individual exercise is a chance for you to do something for yourself. It is a chance to collect your thoughts, to reflect on the day's activities, to plan your day or to just get away for a while. This activity also has the side effect of being good for your body.

• **Involve your wife.** Unit safety officers, try convincing your commanders to have a wives' day. Let the wives see what you do. This safety officer had a wives' day tour and many of the aviators in my unit had many good comments about positive results from this activity. In the context of our tour, the wives were given a short discussion by me on stresses associated with our local mission. Since I was lucky enough to obtain educational television camera and a recorder, we were able to produce and show a rather humorous tape of some of the common problems encountered on the job. We then had one of the flight surgeons give a short talk about signs, symptoms and effects of stress and fatigue. His discussion was a pragmatic one in that after his talk, all of the wives could recognize and assist their husbands in combating these problems. After the discussion and tape showing, we were all bussed to the training area where a brief demonstration was presented to the wives. Some of the observations and questions asked by them were quite surprising.

• **Share your problem.** Family and other problems can be lessened by speaking to the flight surgeon, your chaplain, your safety officer or just a good close friend. The idea is to share your burden. This may lessen the burden or even give you a fresh idea on how to deal with the problem.

As aviators, we owe it to our units, our families and ourselves to be in as good shape as possible. A healthy, well-rested, well-adjusted aviator is a safe aviator. The new AR 95-1 has a listing of environment relative factors. These factors are an attempt to assign a level of difficulty for each mode of flight. As you can see, many of the things that we do are quite stressful. We are sometimes given missions that we don't like to do. This adds to our stress while we are performing our mission. As an example, flying day nap-of-the-earth (NOE) with chemical MOPP-4 (mission oriented protection posture) gear. The environment relative factor for one day NOE is 1.6 and flight with chemical MOPP-4 gear is 3.1. This means that for each hour we fly under these conditions, we are actually expending 4.7 hours of energy and stamina. In order to be effective in our mission to support the ground troops we must be able to withstand the rigors of such stressful flight conditions. This is the main reason that we must exercise, eat proper foods and get sufficient rest.

Fully realizing that our mission comes first, we must take care of our team members so that our mission will be done. A stressed individual's judgment is not always as clear as that of one who is not stressed or who is slightly stressed. He or she often is the last one to feel the stress, much less admit it to others. I can remember in Vietnam hearing one man chide another on several instances, "What's the matter, can't you handle it?" True, in a combat situation, we may be operating in other than desirable conditions, but don't you feel that a better way to handle that situation would have been to suggest that the individual rest as much as possible or to offer encouragement?

As a unit commander, probably the most you may hear would be a very slight remark about how rough the day was or that the individual is tired. Most people just won't go and tell their superior that they don't "feel" totally capable of accomplishing the mission. They will simply attempt it. The danger in this situation is that in an accident investigation, the commander will take the hit for the individual being out of crew rest. Remember, crew rest means a little more than a low enough number on a wall chart or a clipboard. We must consider the whole person and his or her total situation. As a commander you may say that you don't have the time. Well, you do have time to train your platoon leaders and to emphasize combating stress and fatigue.

As the commander you can put sufficient emphasis on physical conditioning and on group activities that are relaxing and not work related. Instead of a cocktail party, why not have a deep sea fishing trip if you are lucky enough to be stationed near the ocean. What about an all-day tour of some historical sight. Try anything that includes families, or at least wives and husbands. These activities should be such that the men and their wives won't polarize themselves into groups, the men over here talking about work and the women over there talking about wives' functions.

As the individual aviator, there are many things that can be done to alleviate stress. At the top of the list is individual exercise. One thing you may try, if you have children, is to find a sitter and get away from them for a while with your spouse. Getting away from the kids is quite relaxing and gives you and your spouse a chance to talk and just enjoy each other. Try and plan to go somewhere *without* television and telephones. A camping trip with your spouse is not the same as a field problem. A fishing trip is quite relaxing. A weekend of skiing is good exercise, relaxing and just good fun. Develop a hobby with your spouse such as gardening. The bottom line is to find something that totally gets you away from your daily stresses. There is some sort of stress in all activity, but new or unusual stresses could be called an adventure or fun. They remove you from the chronic or long-term stresses that cause chronic fatigue.

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Yvonne Lugo photo by NoelKenya Atkins

Hazards of Nonsafety Matches

As the nomenclature states, "NONSAFETY" means just that. Use caution when packing, storing and handling these items.

Use the plastic matchbox, national stock number (NSN) 8465-00-265-4925, to store your matches in. This means you will have to use more than the single empty matchbox supplied in the survival kits.

When you repack your matches, put a piece of paper in the container lid shielding the matchsticks from the sandpaper (scratcher). Place a small piece of cotton in the bottom of the container. Insert the matches with the heads pointing down toward the bottom where the cotton will act as a cushion. Do not overstuff the matches in the box. The size matches you get (some matchsticks are thinner than others) will determine the number you can get into the matchbox. Using 1 or 2 plastic matchboxes, you can get about 20 to 45 matches stored in your survival kits safely.

Do not try testing the matchboxes by throwing them against a wall or on the floor to see if the matches will ignite inside the containers. This is not only dumb, but is hazardous to your health and well being. If properly stored, packed and handled they will not ignite. Don't be an accident looking for a place to happen. Natick Laboratories is the test center and they have the equipment, engineers and testing facilities to do all testing.

Aircraft Seat Belts

Some newly manufactured aircraft seat belts, NSN 1680-00-516-6543, P/N 54H19651-10 are being supplied with the old style latch MS22013-1. The latest configuration for this belt employs the preferred shovel type latch MS3488. Units receiving seat belts with the old style latch MS22013-1 should submit Standard Form 368 Quality Deficiency Report (QDR) to alert the source of supply of this problem. Address your QDRs to: Assistant to Commander for Quality Assurance, ATTN: QAI, Kelly Air Force Base, San Antonio, TX 78241, with an information copy to DRCPO-ALSE, 4300 Goodfellow Boulevard, St. Louis, MO 63120. Seat belts with the old style latch, MS22013-1, are authorized for continued use until further notice. DRCPO-ALSE point of contact is D.B. Hopkins, AUTOVON 693-3880.

Rescue Hoist Forest Penetration Seat

Rescue hoist forest penetration seat, NSN 4240-00-199-7353, change in recoverability code, H-1, H-3, H-53 helicopters. The U.S. Army, manager for subject item, has advised that the recoverability code has been changed to "D." All forest penetration seats, NSN 4240-00-199-7353, P/N K26-1000-9 and interchangeables that become repairable beyond base level capabilities are to be returned to New Cumberland Army Depot (RIC AN5) for repair or condemnation. Stock records are to be updated to reflect this information pending formal publication.

Point of contact for further information is U.S. Army Troop Support Command, (TROSCOM),

DRSTS-SAIA, St. Louis, MO 63120, ATTN: Steve Fonod, AUTOVON 693-3808.

Rejected Requisitions

TROSCOM is experiencing a very high rejected requisition rate. Research reveals that the majority of the rejects are due to the requisitioning of obsolete or controlled items.

To assist in processing and improvement of supply action, ALL requisitions should be reviewed by the initiators to ensure conformity to the TAEDP/UIC/TOE and TDA. For additional guidance, refer to AR 725-50 and the current AMDF. Reprinted from USATROSCOM Materiel Readiness Information Bulletin.

Magnesium Fire Starter

Procurement of the "new" fire starter, aviation survival magnesium, NSN 1680-01-160-5618, is being initiated by U.S. Army Troop Support Command. Stocks are expected to be in the supply system this month.

Department of Transportation Exemption DOT-E-6232

A request has been forwarded to the DARCOM Packaging, Storage and Containerization Center, Tobyhanna, PA 18466, to authorize shipment of the magnesium fire starter tool and the signal kit (flares) packed inside the same package. PEARL will keep you informed as to the outcome of this request.

Revised Inspection Procedure For All U.S. Army Aviation Restraint Equipment

Recent input from the field has indicated that the current inspection procedures for aviation restraint equipment referenced in TM 55-1500-204-25/1 were not adequate to identify proper inspection criteria.

The following guidance is to be used for approved procedures for subject inspection.

a. Check seat belt shoulder harness, restrain harness, inertia reel strap webbing for:

(1) Deterioration resulting from contact with foreign matter (i.e. acid, petroleum based products, strong caustic soaps) shall be removed by washing. If no deterioration is evident after washing, webbing shall be considered serviceable.

(2) Cuts of the webbing caused by a sharp-edged instrument or object that severs the vertical or horizontal yarns of the webbing shall be reason for removal.

(3) Broken stitches may be identified by missing, skipped, torn or ruptured threads in the stitch pattern. Stitching may be repaired and will not be cause for rejection.

(4) Fraying of the exterior surface of the webbing, causing separation or rupture of yarns sufficient to obscure the identity of any yarn exceeding 20 percent of the width or 2 inches in length shall render the webbing unserviceable. Fuzzing of the exterior surface caused by broken individual filaments in the yarns is not cause for rejection.

(5) Discoloration of the webbing caused by contact with grease, oil, aviation, fuels, hydraulic fluids, strong caustic soaps or acid shall be reason for removal from service. Webbing discoloration resulting from contact with metal articles and hardware is not cause for removal. Fading of webbing fabric caused by subjection to sunlight is an unreliable indicator of deterioration and shall not be cause for webbing rejection alone.

b. Any metal restraint hardware which is corroded or defective in operation shall be inspected for operational use and replaced if found to be substandard or excessively damaged. Missing or unserviceable adjuster webbing retarder springs and loose or missing bolts will be replaced.

(1) Check buckle mechanisms for ease of locking and releasing. When locked, the latch should not have a tendency to release inadvertently, nor should it be excessively difficult to release.

(2) Pilot/troop type belts, check for freedom of movement of the link within the mated hook and guide bar. The link shall not bind in any position (i.e. pivot and hook tip) within its operating limits.

c. No cleaning is authorized to inertia reel webbing strap.

This will be considered as authoritative until the subject inspection procedures are published in a future revision or change to TM 55-1500-204-25/1. Point of contact at this command is Mr. John Abernathy, DRSTS-MCAPS, AUTOVON 693-3880. (ALSE Message 83-7, date time group 241345Z Oct 83).

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120 or call AUTOVON 693-1218/9 or Commercial 314-263-1218/9

in the air — and on the ground

Safety

U.S. ARMY SAFETY CENTER

AT LEAST 20 PERCENT of the fatalities in Vietnam were the result of accidents. Accidents claimed more than 5,700 lives, disabled more than 106,000 soldiers and produced nearly 5 million non-disabling injuries.

Speaking at the U.S. Army Safety Center, Fort Rucker, Alabama, Major General John H. Mitchell, Director of Human Resources Development, said, "We are outnumbered in the Warsaw Pact scenario in every single category—tanks, artillery, human beings—all of them. We cannot afford to go into combat again with a preventable loss rate like we had in Vietnam."

General Mitchell, the first general officer to be named as Director of Army Safety since George Washington appointed his inspector general to that office, continued, "We have got to have a safety strategy that will carry us through mobilization and into combat."

How is the Army going to develop such a strategy? As a beginning, it's going to capitalize on its own success. In April of 1978, the Army began investigating aviation accidents on a worldwide basis. Aircraft accident investigations have since identified system safety deficiencies in the materiel, training, and human areas. Agencies responsible for development, procurement and maintenance of aviation equipment have responded to accident investigation team findings by developing effective corrective or remedial measures. Deficiencies or inadequacies in accident prevention training are corrected in the schools of Training and Doctrine Command as well as in unit training and field training exercises. The toughest problems to solve have proven to be in the area of human deficiencies. The commander of the Army Safety Center, Colonel Joseph R. Koehler, attributes as much as 75 percent of the aviation accident rate to some kind of human error. Centralized investigation of accidents has proven effective in both identifying and correcting safety problems in aviation.

In spite of the fact that a yearly average of 575 soldiers were being killed in nonaviation accidents, and another 10,000 were suffering disabling injuries, there was no program for centralized investigation of ground accidents. Ground accident reports received at the Army Safety Center often did not provide enough of the in-depth information needed to do comprehensive analyses of cause factors and to develop remedial measures. The systems approach, which was being effectively applied to aviation mishaps, was lacking in ground accident investigations and the Army was losing the equivalent of a field artillery battalion each year. In addition, a study by the Inspector General in 1977 had already confirmed what the military leadership suspected to be true. Reported dollar losses from ground accidents were less than $20 million when actual loss figures were nearer $257 million.

General Maxwell R. Thurman, Vice Chief of Staff Army, who was then DCSPER, took a hard look at what centralized investigation of aviation mishaps had accomplished and directed that the Army's safety program be restructured with adequate resources dedicated to bringing ground safety up to the same level as aviation safety.

An important part of the resulting effort was a centralized ground accident test program which began in October of 1982. Forces Command, which has equipment and operations that are representative of the Army as a whole, agreed to participate in a 6-month pilot program. (In January of 1983, the Army National Guard joined the program.) Early results proved the validity of centralized accident investigation ground (CAIG) and instead of ending after six months, CAIG was expanded.

In October of 1983, CAIG of Class A accidents went CONUS-wide, with the exclusion of Alaska, Hawaii and Panama. Selected accidents are investigated Army-wide. Class A accidents are on-duty, non-POV, ground accidents where the total cost of property damage, injury, or occupational illness equals $500,000 or more, or a fatality occurs as a result of Army operations. Off-duty accidents resulting in a fatality of Army military personnel are also designated as Class A but these accidents are not included in CAIG.

A typical ground accident investigation team from the Army Safety Center is composed of a field grade officer, a military investigator and a civilian investigator. These teams are supplemented by additional board members at the location of the accident. (The additional board members do not come from the unit which had the accident.) Supplemental team members may be senior equipment operators, maintenance officers, medical officers or others whose qualifications are required by the nature of the accident.

After the investigation has been completed, the accident board president briefs local commanders on findings and recommendations which have been developed up to that point. The team then returns to the Safety Center to complete their formal report. The report is sent to the lowest responsible command level where it is processed by the chain of command for review, comment and necessary actions to the major command which has approval authority.

CAIG provides a commander with an unbiased picture of a unit's safety posture. It sometimes reveals problems which can be attributed to inadequate training, poor maintenance of equipment or lax supervision—problems which can be corrected at the unit level. When the problem is identified as a lack of formal training, the CAIG board findings can provide the impetus for improving service school training of equipment operators and maintenance personnel. Concurrently, operator and maintenance manuals can be updated and improved.

As a result of centralized investigation, areas are sometimes revealed for which no formal training has been developed. This was the case with drivers' training proponency. The Army does not presently have formal drivers' training for all vehicle

operators. Therefore, unless a soldier holds the 64 Charlie MOS, he may be licensed to operate a vehicle for which he has had little of the regularized training needed to qualify him as a safe driver. This discrepancy is now being corrected as doctrine and training are being developed for drivers' training.

Another value of centralized investigation is identification of safety deficiencies which require Department of the Army level actions. Once such a problem has been identified, a project officer is assigned to it at the Army Safety Center. The responsible DA agency is informed of the investigation report's findings and recommendations and the project officer follows up to ensure approved remedial actions are taken.

An Army safety technical advisory office has been established in the Pentagon to assist the Director of Army Safety in his liaison efforts with the research and development agencies. Entry into the research and development community will mean equipment and design safety problems can be identified before the equipment is approved.

Safety is rapidly moving into the Army's "schoolhouse." Accident prevention and technology instruction are already in the Sergeants Major Academy and first sergeants course. Later this fiscal year these subjects will be in the Command and General Staff College and by the middle of FY 84, instruction on safety should be a part of the program of instruction for officers' advanced and basic courses and other professional development courses.

The test of CAIG showed that it is an effective program just as centralized investigation of aviation mishaps has proven to be. For those individuals who remember the U.S. Army Agency for Aviation Safety (USAAAVS)—or for the real oldtimers, the U.S. Army Board for Aviation Accident Research (USABAAR), the expanded mission of the U.S. Army Safety Center may take a little getting used to. It is no longer limited to aviation safety but covers safety for the foot soldier, armor, artillery, transportation, ordnance—all of it.

Safety for the entire U.S. Army is a very big business and an indisputably important one. Just how important is reflected in the interest shown by the Army's top leaders and their determination to fix responsibility for accident prevention where it belongs—on command leadership. The Army is in dead earnest about safety.

A successful accident prevention strategy does not mean that commanders have to choose between realistic training and safety. It does mean that the value of a particular exercise should be weighed against inherent risks before a decision is made. The earlier safety people are involved in the planning stages for risk management, the more effective accident prevention efforts will be. Realistic training is needed to produce combat ready crews and equipment—but assets lost on the way to the war don't count.

In his message on progress and changes in the Army safety program, General Thurman says, "The final objective is a single, proactive, highly visible Army safety program under strong command leadership at every level." The VCSA cites the Army's success in saving lives and equipment in aviation as an example of how direct leader involvement can affect safety. "We cannot accept accidents as 'just the cost of doing business' in a high-risk environment," he emphasizes. The message concludes, "We seek a balanced, leader-oriented safety program that both prevents accidents and enhances readiness. **Accident prevention is a combat multiplier.**"

Additional source of information
Countermeasure, September 1983

Noncommissioned Officer Logistics Program

Sergeant Major Earl V. Stinson
Office of the Deputy Chief of Staff for Logistics
Washington, DC

THE NONCOMMISSIONED Officer Logistics Program (NCOLP) dates from 1955, when the Quartermaster Corps initiated the Quartermaster Noncommissioned Officer Career Development Program. Initially, it served as a means to retain NCOs who had become highly qualified in depot supply and maintenance activities. These NCOs could form the nucleus for future expansion of the logistics system in the event of mobilization. These early members of the career program proved so invaluable that in 1961 the Department of the Army announced the opening of more positions throughout the Army and in 1963 the NCOLP was instituted to replace the NCO Logistics Career Development Program. In 1974, the program was studied to see if it was viable. The results confirmed the definite need for the NCOLP—that professionalism in logistics had become of paramount importance—the NCO logistician is a valuable asset and there will be a continuing need for NCOs with knowledge of multifunctional logistics.

Position Nomination

The commander can determine specific position needs requiring a senior NCO trained in two or more functional logistics areas. To date, more than 2,182 positions have been identified and entered into The Army Authorization Document System (TAADS). The NCOLP has been restructured and positions are now primarily in grade E7 to E9. Commanders may recommend positions for NCOLP designation through administrative channels to Office of the Deputy Chief of Staff for Logistics (ODCSLOG). An NCOLP position review board at the Logistics Center evaluates and recommends (only) those positions and MOSs that materially contribute to the Army logistics system. Based on the recommendation, ODCSLOG informs the nominating commander and enters the requirement into TAADS. Changes or deletions to approved positions must be forwarded to ODCSLOG. This system is not designed to interfere with the commander's prerogative to identify specific MOS requirements, but to centralize control of the designated NCOLP positions.

Membership in NCOLP

NCOLP entry is voluntary. Recruiting is done by current members, sergeant majors and by logistics unit commanders. AR 614-200 prescribes the program objectives, responsibilities, prerequisites for entry, member use and other NCLOP management aspects. The recruiters must assure themselves that the NCO meets the prerequisites. When an NCO is recruited, an application is sent to MILPERCEN (Military Personnel Center) where a board selects the best qualified NCO. Once accepted, the NCO receives a certificate of acceptance.

Training and Assignments

Initial training for NCLOP members will be the resident NCOLP course which provides members with a broad and comprehensive knowledge of logistics, specifically in unit, divisional, corps, TAACOM and wholesale levels. The course covers the logistical spectrum from unit movement to distribution management of major items at wholesale level. Careers of members will be developed through assignments to increasingly more challenging NCOLP positions, e.g., unit, brigade, division, corps, field Army and to wholesale or a mix of assignments in any of the aforementioned levels. AR 614-200 contains other courses the NCOLP member can take to assure training in broad logistical functions with equal emphasis on supply, maintenance, transportation, management and the interface of these disciplines.

Program Expectations

NCOLP provides commanders with trained NCOs. The NCO logistician can be the backbone of a logistics system and be the means of adequate logistical support early in any military contingency. He or she can also be the source of training for less experienced junior officers. The NCOLP authorization fill must be requisitioned in accordance with AR 614-200 by indicating requirements for personnel with special qualifications with assurance special skilled personnel are assigned to positions requiring these skills.

The NCOLP is in response to the commanders critical need to have highly trained NCOs for select positions requiring knowledge in two or more logistics functions. It is the commander who must enhance the career attractiveness and dynamics of the program by ensuring only NCOLP members are assigned to valid K (KILO) MTOE/TDA positions within the command thereby assuring the continuous logistical education of the member.

SCHOOL MODEL 83

A New Organizational Structure at Fort Rucker

Mr. H.L. Flowers
Chief, Force Development Division
Directorate of Resource Management
U.S. Army Aviation Center
Fort Rucker, AL

WE HERE AT "The Home of Army Aviation" have recently completed an extensive reorganization that significantly affects the management structure of the U.S. Army Aviation Center. Accordingly, we think it appropriate to identify and share the structural and functional changes we have made, with the aviation community. Hopefully, this effort will prove to be helpful in accomplishing your assigned aviation duties.

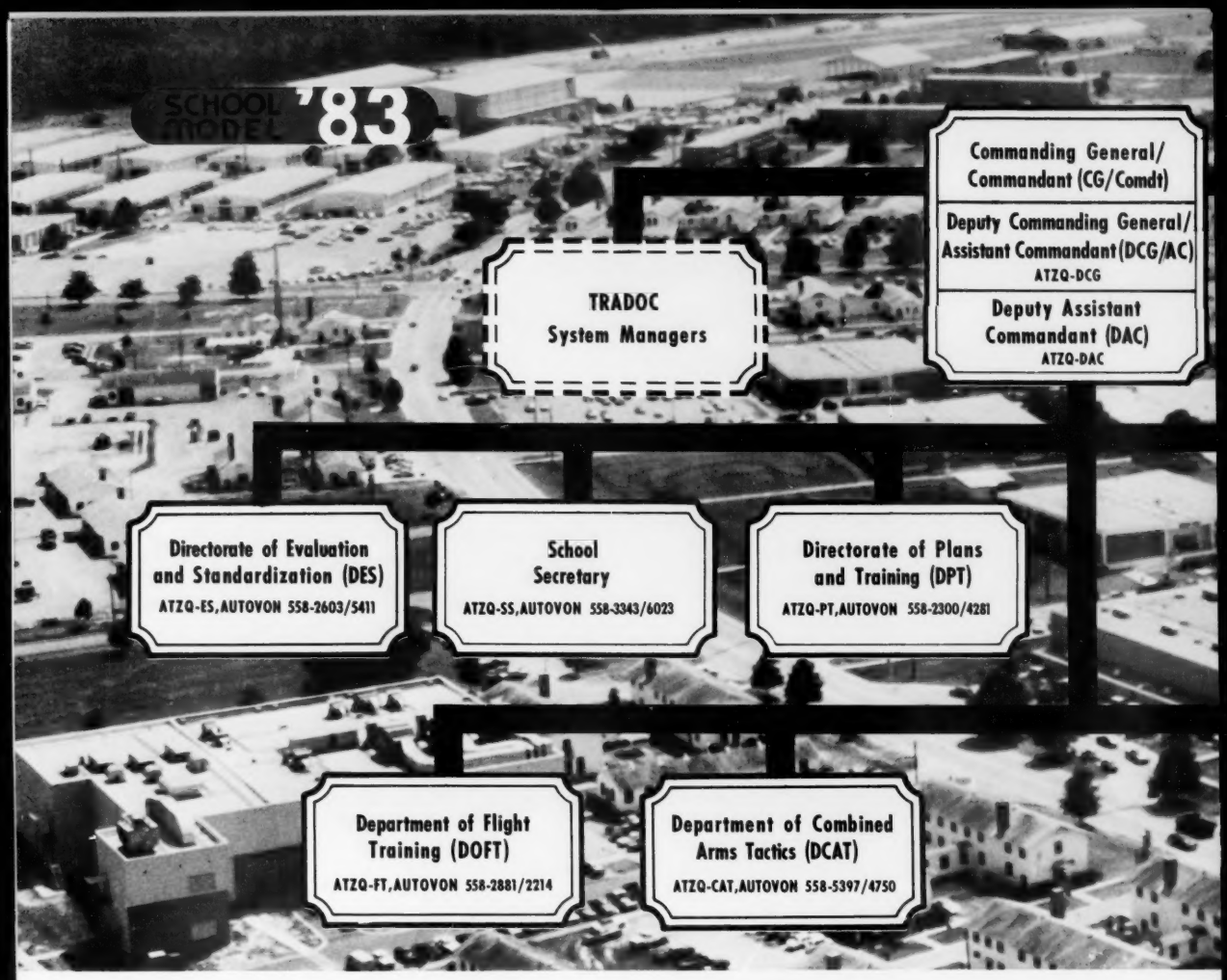
During the period 1973 to 1975, the Aviation Center functioned under a consolidated center and school organizational structure. This concept, the first in the Training and Doctrine Command (TRADOC), consolidated school and garrison activities into one Table of Distribution and Allowance (TDA), allowing for the integration of similar functions yet conserving manpower and streamlining day-to-day management.

In 1976, we were able to retain the major thrust of this operational concept when TRADOC directed the implementation of "School Model 76," a structure which drastically changed both the decision process and the way service schools went about completing their instructional and developmental missions.

Summarily, School Model 76 established a Directorate of Training Developments chartered to make training decisions, i.e., the "what, where and how" arm of teaching. Under this system, instructors and instructional departments were, for all practical purposes, isolated from the activity engaged in producing the actual training material they were being required to present. Over time, this separation tended to delete or detract from the knowledge and capability of our instructor workforce. Simply stated, instructors were becoming outdated since they were not actively involved in the total teaching process which should include literature formulation and selection as well as doctrine development. The long-range impact of this environment is degradation of training conducted in the "schoolhouse," both in the terms of quality and quantity.

As an achievable and worthy objective, the TRADOC commander initiated action in April 1983 to revitalize the training base and to elevate student instruction and doctrine development to the *Number One* and *Number Two* mission priorities, respectively, within the Training and Doctrine Command. This philosophy and direction is being brought to fruition through a major reorganization of all TRADOC schools. It is commonly referred to as "School Model 83."

The new school structure, coupled with the recent designation of Army Aviation as a separate branch, generated a two-fold requirement for the Aviation Center. First, we had to reorganize to comply with TRADOC's organizational structure directives which sought to expand the responsibilities of the trainers, improve the training process and make the instructional departments the "real heart" of the schoolhouse. Second, the structure we were to put in place needed to "relook" the way we planned to operate to ensure the concept was flexible enough to support centralization of Aviation proponency and to conduct captains' and lieutenants' training. With

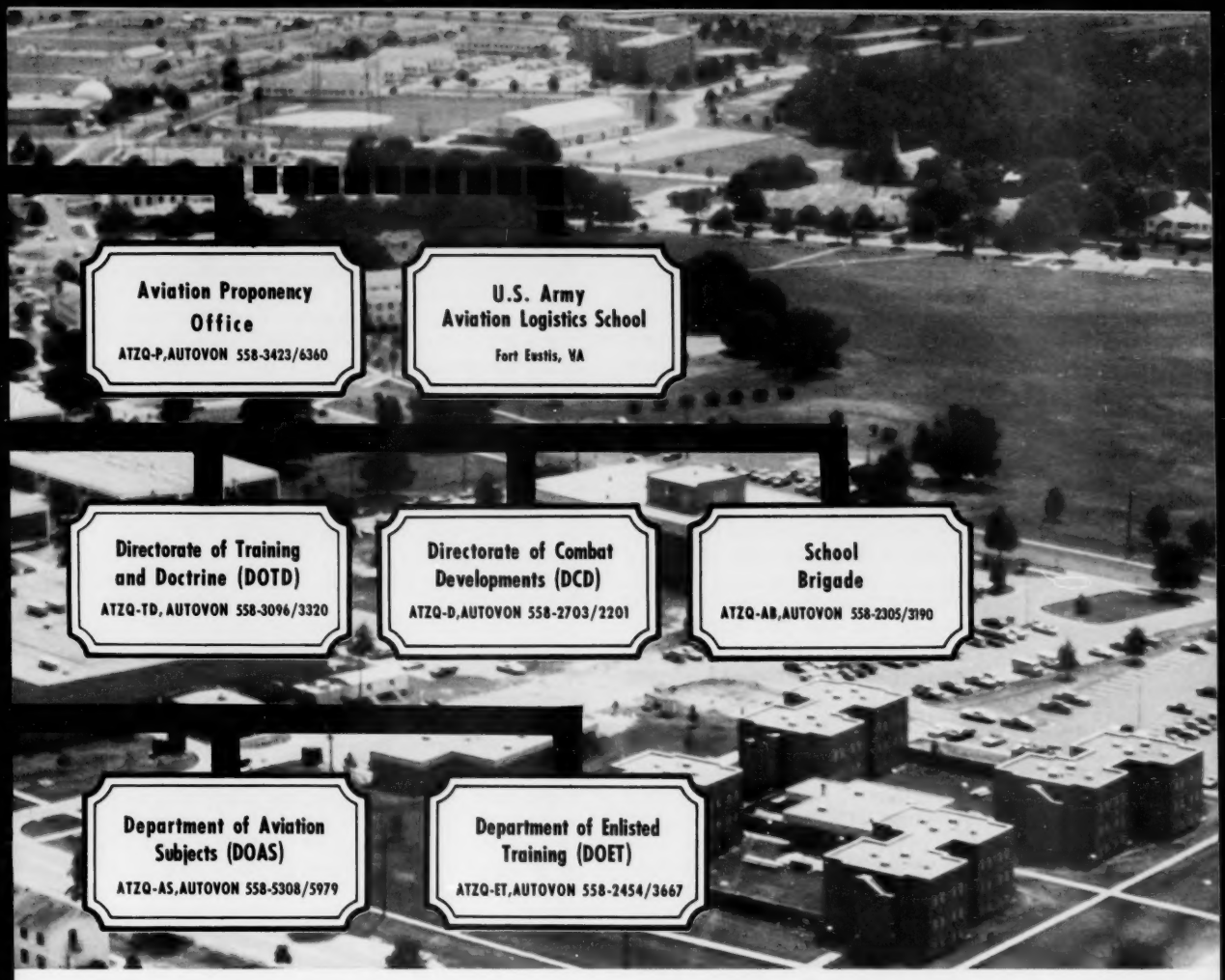


these objectives, effective 1 October 1983, we reorganized the "training side" of our structure as reflected in the accompanying figure. We retained the capability to manage manpower, personnel and equipment assets, used by both the Center and School, from one TDA to ensure continued conservation of our scarce resources.

The Aviation Center's revised structure created eight new organizations, disestablished three existing activities and changed the role of five others.

Office of the Commanding General/Commandant (CG/Comdt). The responsibilities of the CG/Comdt were significantly expanded due to centralization of Aviation proponency at the Aviation Center and the designation of Aviation as a separate branch. The Aviation Center commander is now responsible for Aviation concepts, studies and doctrine and is also serving as the Aviation Branch manager for both personnel and materiel. This expansion includes serving as the proponent for the newly established *U.S. Army Aviation Logistics School* located at Ft. Eustis, VA, which is chartered to exercise responsibility for all Aviation logistic matters.

Office of the Assistant Commandant/Deputy Commanding General (AC/DCG). The role of the assistant commandant/deputy commanding general also has been expanded. Within the framework of our new organization, the AC/DCG's principal responsibility includes directly supervising all activities of the School to include the TRADOC System Managers and the training department directors. This change



eliminated the intermediate Directorate of Training and Doctrine and elevated each training department to line status.

Office of the Deputy Assistant Commandant (DAC). This is a newly activated office which has been established under the School Model 83 concept. At the Aviation Center, the DAC functions as a principal assistant to the AC, monitors taskings, and assists in the accomplishment of administrative and management duties associated with the day-to-day training responsibilities. This office also effects coordination among internal training elements, higher headquarters, integrating centers and other schools and activities.

Aviation Proponency Office. This newly established activity is chartered to assist the commanding general in carrying out his Aviation Branch duties and to serve as the coordinating element for internal and external issues associated with Aviation management.

Directorate of Evaluation and Standardization (DES). This directorate will continue to accomplish independent evaluation functions for the School and support the Department of the Army, Deputy Chief of Staff for Military Operations worldwide aviation standardization mission. The responsibilities of DES also include writing aircrew training manuals and management duties associated with the publication of the *Army Aviation Digest.*

School Secretary. A nonexisting activity, prior to our reorganization, has been established to assist the AC/DCG in carrying out his school

related administrative and management duties. This organization is comprised of student academic records, training material storage and issue, aviation historian, school library, aviation learning center, visitors' support/protocol, student evaluations and allied military training. The principal functions of this newly established organization were realigned from the Directorate of Personnel and Community Activities, Department of Academic Training and the 1st Aviation Brigade.

A new *Directorate of Plans and Training (DPT)* has been established and the previously existing Directorate of Training and Doctrine (DOTD) eliminated. The DOTD, prior to elimination, provided day-to-day supervision to the training departments and accomplished related resource management duties. Under the new structure, training departments are supervised by the AC/DCG negating the need for an intermediate layer of supervision. The new DPT director will function in a dual capacity, i.e., serving as the opertions chief for both the Center and School. He will also manage assigned aircraft, monitor the use of flight training facilities and supervise training aids and audio-visual activities. Coupled with common DPT functions, included in this organization is resident training management (RTM) normally found within other school activities. The office of RTM develops and manages the flying hour program, formulates resident student class flows and prepares and submits class schedules.

Directorate of Training and Doctrine (DOTD). A new DOTD (not to be confused with the former DOTD discussed in the preceding paragraph) has been established to partially assume responsibilities previously assigned to the Directorate of Training Developments, which has been eliminated. With this elimination, writer responsibility for training development products was transferred to the training departments. The new DOTD is chartered to manage and coordinate training development activities internally and with the writers and subject matter experts now located in the instructional departments. This directorate will also interface with system managers, branch proponents, training departments and industry to support the development of aviation systems, related equipment and appropriate training materials.

Directorate of Combat Developments. The organizational structure of this activity has not changed. However, its mission will be greatly broadened to assume combat development workloads to be realigned from other branch schools in compliance with the decision to centralize Aviation Proponency at the Aviation Center. This directorate will serve as the program manager for actions encompassed by the force development/combat developments process in support of the Aviation program.

School Brigade. This activity will continue its current mission and accomplish command and control functions for our Center and School consolidated command structure. Even though not affected by School Model 83, this unit has been reorganized to support changing workloads. Two additional student companies have been added to support the captains' and lieutenants' branch courses. A major portion of the training required by these courses will be given by the cadre of these companies.

Major restructuring has occurred in our training departments. The previously established Department of Academic Training was eliminated and separate departments for *Aviation Subjects (DOAS), Enlisted Training (DOET)* and *Combined Arms Tactics (DCAT)* established to take its place. The DOAS will write training literature and teach subjects associated with flight academics and flight systems. Management and operation of the Center's flight simulators and cockpit procedural trainers are also assigned to this department. DOET will also write training literature and conduct all enlisted training, to include UH-1/OH-58 maintenance and air traffic control. DCAT will author aviation doctrine, write training literature and teach our management, leadership, tactics and combat support subjects. The *Department of Flight Training (DOFT)* will continue to teach undergraduate and graduate flight training. The director of DOFT will also serve as the Command Aviation Officer and direct the activities of the instrument and aviator qualification activity which manages the local aircrew training manual program. In all cases, training departments will take part in the decision process on issues concerning the training base.

Changes in the structure at the Aviation Center are viewed as a major step in upgrading the quality of both our training and instructor workforce. Enhanced supervision, increased visibility and dual instructor/writer positions are considered key ingredients to meet this end.

As success with this reorganization continues, training will be improved and the expertise and prestige of our instructor/writer workforce will be reinforced.

REPORTING FINAL

Late News From Army Aviation Activities

FROM FORT RUCKER

Fort Rucker Population Increase. According to the most current figures available, it is anticipated the daily increase in population at Ft. Rucker by late summer 1984 will be about 220; 210 as the result of the Aviation Branch training for captains and lieutenants and 10 in the new night vision goggles training course.

Looking ahead to fiscal year 1985 (FY 85), the daily population increase is expected to go up an additional 214 personnel to 434, based on the year's daily student load of 300 for the captains' and lieutenants' training, a daily population increase of 28 students for AH-64 Apache training, 6 for UH-60 Black Hawk training and about 100 permanent party personnel.

A breakdown on the captains' training for FY 84 shows there will be a student input of 140, or 70 for each of two 16-week classes. Those classes will begin 4 June and 13 August.

For lieutenants' training in FY 84 the input will be 105. That comes from 35 students expected to attend each of three 8-week classes.

Since there will be two of each class in residence after the initial beginning period, the daily increase will total 140 for the captains and 70 for the lieutenants.

Another training increase for FY 84 is a new 4-week course to teach the use of night vision goggles. Thee will be 12 of those, with 10 students each for an annual input of 120.

In FY 85, there will be 5 classes for the captains' course with 80 students per class. Starting dates are 7 January, 4 March, 29 April, 24 June and 19 August.

Lieutenants will have 10 classes of 70 students each in FY 85, beginning tentatively on 11 January, 8 February, 11 March, 9 April, 6 May, 4 June, 2 July, 31 July, 28 August and 26 September.

To prepare for the acquisition of the AH-64 Apache helicopter (the first one is scheduled to arrive at Ft. Rucker in the fall of 1984), a 14-week aviator qualification course will begin in January 1985. Classes are programed to start every 2 weeks, initially with only 2 students per class and expanding to 8 per class by the end of the year for a total annual input of 118. The average daily student load for AH-64 training is projectd to be 28 per day for FY 85.

A student increase of 108 is also scheduled for the UH-60 Black Hawk course in FY 85, equaling an average daily increase of 6.

Other training programs are being contemplated for FY 85; however, they have not been funded at this time. If those programs are funded, an additional daily strength of 200 students could be achieved.

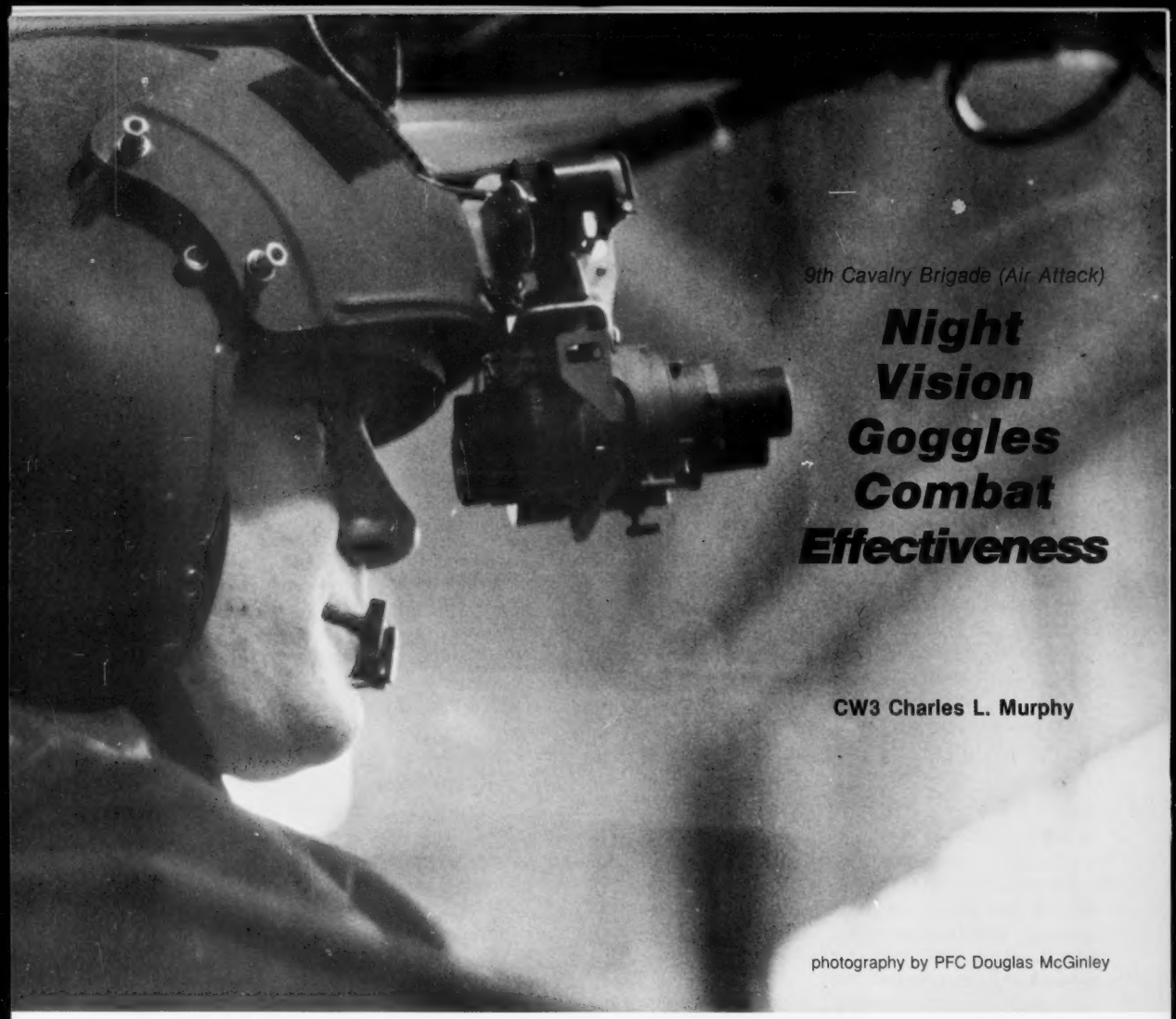
To support the programed training increases, new and revamped facilities are required. Approved construction for the current fiscal year includes new lanes and other improvements to airfields, 15 new classrooms and an AH-64 flight simulator building. The approximate figure for this is $10.6 million.

The only approved item now on the list for FY 85 is an AH-1S Cobra flight simulator building with an estimated price tag of $2.3 million.

While nothing definite is available on times or costs, construction plans for the near future include two 200-person quarters for the officers who come to Ft. Rucker for the captains' and lieutenants' training. However, it is not anticipated the BOQ will be ready for occupancy until after FY 86.

The strength of the growth expected at the home of the Army's new branch does not derive from large numbers but rather from its permanence; ongoing years will reflect similar inputs for the branch training.

According to Major General Bobby J. Maddox, Ft. Rucker's commander: "We aren't going to astound the world with large increases in numbers; but we are going to impact on the excellence of the entire Army with the steadfast, encompassing strength of its Aviation Branch." **(USAAVNC-PAO)**



9th Cavalry Brigade (Air Attack)

Night Vision Goggles Combat Effectiveness

CW3 Charles L. Murphy

photography by PFC Douglas McGinley

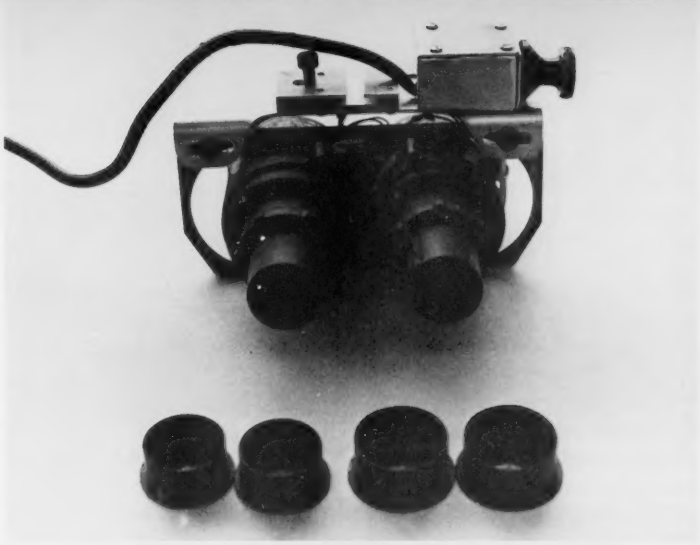
NO one will argue that the way to survive on the mid-intensity battlefield is to deny the Threat the use of as many weapon systems as possible. Fighting at night can degrade the enemy's capability to destroy airframes by eliminating direct view optics and trackers from his arsenal, unless he is willing to accept the cost of mass employment and night sighting systems. The basic idea of effective aerial weapon systems employment in a night environment has been around for a long time—probably as long as the airframes themselves. But, only recently have imaginative ideas and innovative programs blossomed into "real time" solutions to the problems preventing effective aerial ordnance delivery.

By taking a realistic, logical and commonsense approach to these problems and conquering the basic limitations each imposed, the Black Knights of the 3d Squadron, 5th Cavalry have attempted to conquer night combat operations and training. The remainder of this article will focus on some of the basic problems encountered with night operations from an equipment standpoint, workable solutions to these problems and integration of these solutions into a viable "now time" night capable weapon system.

One of the first problems encountered with an aerial weapon

system is to develop a stable platform from which the weapon will operate. A usable premise is that weapon effectiveness is directly proportional to the stability afforded the system. This in itself is not a new idea. Manufacturers of the AH-1S, AH-64A and the JOH-58C have found this to be true. The stability augmentation systems designed for these aircraft do their intended job well. They provide a stabilized platform for the weapon and the aircraft sighting systems. However, the advent of the pilot's helmet sight subsystem (HSS) and the integration of the night vision goggles (NVG) (AN/PVS-5A) into the fire control system has placed a greater dependence on the avaitor's helmet as a stable sighting platform. The current production SPH-4 fails to do an acceptable job. The problem is the inherent design of the standard suspension system. No matter how tight the aviator makes the headband and strap assembly, or how stiff he holds his neck and head, the SPH-4 will oscillate. This oscillation is caused by vibrations manifested in the airframe by weapons firing or by the weight of appendages attached to the helmet. The oscillation occurs in all axes of rotation.

The Black Knights, working in conjunction with the 9th Infantry Division High Technology Test Bed, have solved this stability problem. Selected members of the Black Knights are testing custom made form-fitted helmet liners adapted for the SPH-4 by the GENTEX Corporation of Pomona, CA. At this writing, 16 of these modified helmets are being evaluated. Preliminary results indicated the stablilized helmets/helmet sights allow firing within coincidence tolerance and provide a sharp increase in the weapon system operational readiness rate by eliminating erratic gun drive operation and the resulting excessive gun drive component wear.



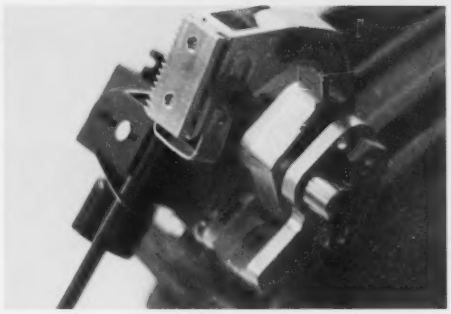


FIGURE 1 (above): Modified PVS-5A, face plate removed, switch and wiring rearranged.

FIGURE 2 (left): Extension arm in the half up position—mounted to the helmet bracket. Note static stop on goggles and an adjustable safety detent at opposite end of arm.

The second problem to overcome in developing an effective night weapon system is to incorporate a night sight capable of all the functions required for the weapon employment. In the case of the 3-5 Cav, a sight was required that allowed employment of the AH-1S turret cannon in the flexible mode at maximum stand-off ranges. Altering the current night vision goggles and integrating them into the fire control system was determined the most cost effective and easiest to procure.

Alteration began with the removal of the fiberglass face shield and foam face plate. A mounting plate was designed to support the objective lenses, and after the on-off switch, battery and wiring harness were rearranged, the lenses and associated hardware were mounted to the bracket. The design and mounting afford easy switch operation with the left (collective) hand and for lateral adjustment of the objective lenses on the mounting bracket. This allows the wearer to fit the objective tubes comfortably in front of the eyes (figure 1).

The next step was to design an extension arm that would allow the goggles to hang stable but away from the user's face. This design allows the wearer to look about the

cockpit without removal of the unit and increases the ease of map reading. The extension arm also allows for the wearing of eye glasses behind the goggles unit thus eliminating most astigmatism problems associated with this type of flying. The extension arm was also designed not to interfere with the standard daylight HSS reticle unit currently in use. Other desirable features incorporated in this part of the mounting assembly include verticle and focal length adjustments, a locking detent for securing the goggles in place and a quick release mechanism to facilitate rapid removal of the objective lenses (figures 2 and 3).

The two pieces mentioned above were then mated to a bracket designed to be an integral part of the helmet. The helmet mounting bracket provides increased stability by using tension loaded feet at its base while the main attaching point secures to the visor track. This feature makes each mount easily adaptable to any helmet with a visor track (figure 4). A quick release pin is used to attach the goggles and extension arm to the helmet bracket. A positive locking detent is incorporated to secure the goggles in the up position when not in use (figure 5).

The final step in designing the night weapon system used by the Black Knights was to incorporate a way to boresight the altered night vision goggles to the helmet sight subsystem and adapt the daylight reticle for use with the modified system. Paramount in the design of this portion of the system was the necessity of the daylight reticle to retain its boresight when removed and replaced on the helmet. Keeping this in mind, the design was ac-

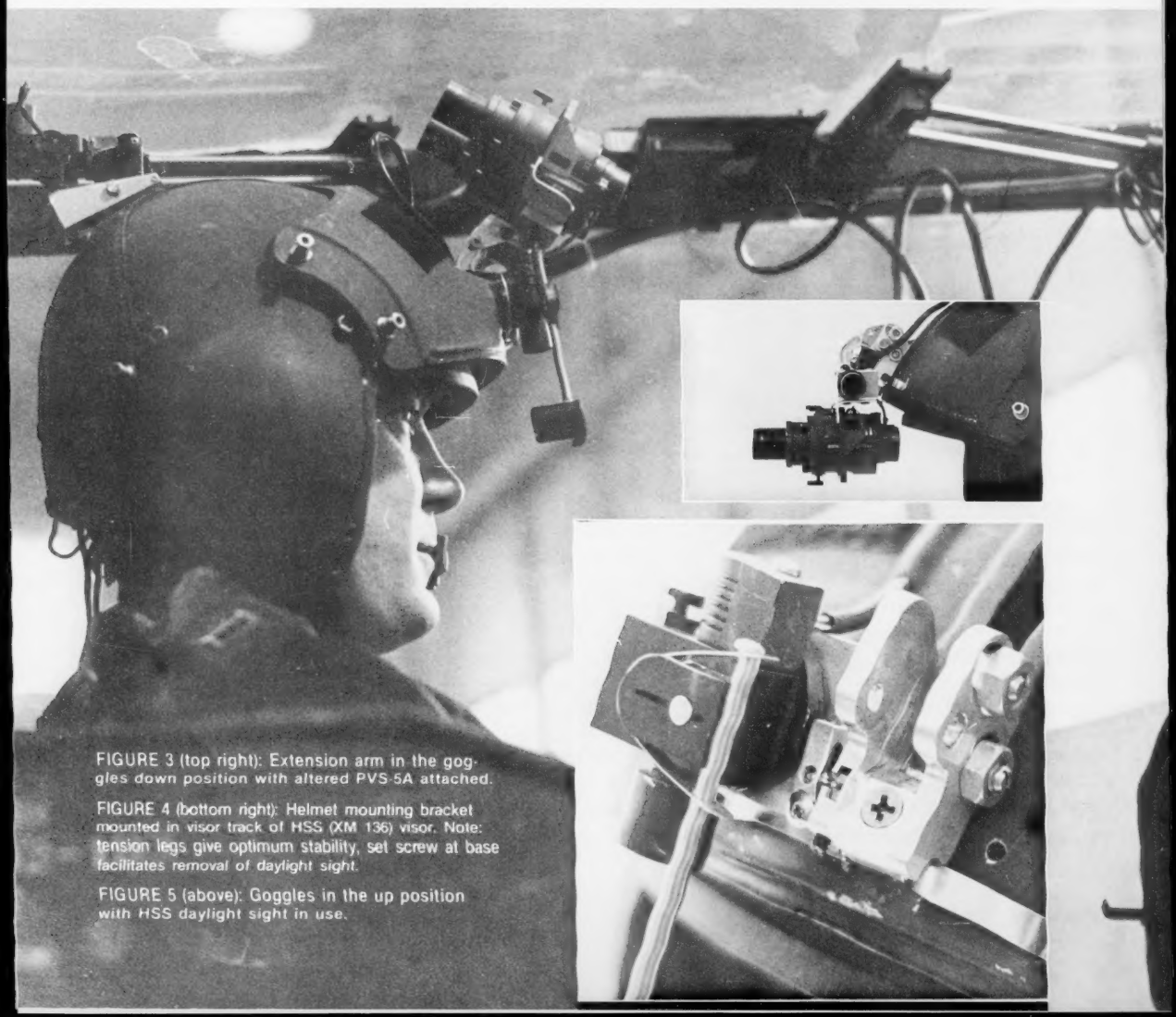


FIGURE 3 (top right): Extension arm in the goggles down position with altered PVS-5A attached.

FIGURE 4 (bottom right): Helmet mounting bracket mounted in visor track of HSS (XM 136) visor. Note: tension legs give optimum stability, set screw at base facilitates removal of daylight sight.

FIGURE 5 (above): Goggles in the up position with HSS daylight sight in use.

complished in two phases. Phase one was to adapt the standard HSS resolver to the modified night vision goggles system while ensuring compatability with the goggles field of view. This task was accomplished by developing a hinged bracket under the sight resolver that would afford gross adjustments of the resolver line of sight to the field of view. Fine adjustments are made as usual. By using boresighting techniques (discussed later in this article) the night vision goggles now replace the HSS daylight reticle during periods of darkness.

Phase two was to make the HSS daylight sight usable during daylight hours without losing the night capability of the goggles. This was accomplished by designing a bracket for the daylight reticle unit that would allow line of sight adjustment of the HSS reticle to match the resolve and goggles. A set screw design allows for removal and replacement of the HSS reticle unit without loss of boresight.

I have described in general terms the system in use by the 3-5 Cavalry at Ft. Lewis. Two important questions still to be answered are: How do we make it work? And, what do we do with it?

In order to make the system work, it must first be boresighted. Our boresighting procedure begins with a bright, sunny day. The wearer of the modified goggles installs the system and ensures the day filters for the goggles are in place. The aviator then turns the goggles on and selects an object for sighting at a range of 1,500 to 2,000 meters. Using the distant aiming point boresighting procedures standard in the Army, the unit armament personnel then adjust the HSS resolver. First, adjustments are made with the modified hinge plate and fine adjustments are made with the resolver adjustment screws. This procedure requires no special tools or equipment and can be accomplished in a short period of time with the standard HSS boresight equipment. Once the goggles are boresighted (HSS resolver line of sight is adjusted to coincide with the goggles field of view) adjustments can be made to the daylight reticle. These adjustments are made by loosening the lock-down screw at the base of the helmet mounting assembly and moving the HSS mounting bracket into coincidence with the resolver line of sight. Simply tighten the lock-down screw and the system is ready for operation.

FIGURE 6: CW3 Murphy demonstrating the use of the pop-up goggles and techniques for NVG TOW missile firing.

The 3d Squadron, 5th Cavalry has begun training all assigned AH-1 aviators in NVG gunnery techniques. To date, all AH-1 aviators have been familiarized and individually qualified at individual NVG gunnery. Individual qualification included 2.75 inch rocket and 20 mm cannon firing. A successful TOW missile firing was also accomplished by the squadron (figure 6).

The squadron continues to train for night combat by increasing its emphasis on night combat skills, including NVG gunnery, and team exercises.

The Black Knights have developed a viable solution to night combat effectiveness and have demonstrated that with realistic training, a little imagination and a lot of hard work, that the Threat can be exploited at night.

NOTE: The NVG effort described was done as a special test for the High Technology Light Division.

ABOUT THE AUTHOR

The author (at right), working in partnership with Chief Warrant Officer Uwe U. Schwaier, developed the system described in this article. CW3 Murphy has flown more than 100 hours on this system, has successfully fired TOW, 2.75 inch rockets and flex mode 20 mm cannon. CW3 Murphy is currently the squadron standardization officer for the 3-5 Cavalry at Ft. Lewis. CW3 Murphy is an AWOAC graduate and holds a B.S. in aviation management.

Timeliness In Army Aviation

THROUGH THE past year during tactical evaluations of virtually every aviation unit in the Army by the Directorate of Evaluation and Standardization (DES), we have noted a disturbing trend which must be corrected. Somehow, units and individual aviators seem to have misplaced their sense of urgency and resolve. Timeliness is not receiving sufficient emphasis; consequently many aviators do not understand the importance of being at the right place at the right time.

The ground forces of the United States Army have always emphasized meeting set times. Armor, Infantry and Field Artillery work hand in hand during actual and simulated combat operations. In all of these tasks, timeliness is the key that enables the combat arms to synchronize their effort, resulting in a high degree of success.

If Aviation is to be effective, it must work in concert with the other combat arms. To do this, Army aviators must always be at the location specified in the operations order—*on time.*

The solution to this exhibited lack of urgency lies with both the unit commanders and individual aviators. Unit commanders should themselves demonstrate punctuality and demand it of their troops in meeting formations, briefings and appointments. When soldiers become disciplined to being prompt in other endeavors, then they will execute combat missions in a like manner.

The individual aviator has "how-to-fight" manuals, has been trained, knows what to do and is aware how much time it will take to do it. For example, a lift is to be onstation at 0800 hours and the briefing will be held at 0645 hours. The smart aviator will have the preflight complete and a run-up done prior to 0645 hours. Then if a problem occurs, maintenance and avionics personnel have some time to make repairs or put up another aircraft. The bottom line is that aviators must condition themselves to be at prescribed locations at designated times to be combat effective.

To illustrate the disastrous results that a misplaced sense of urgency/timeliness can generate in a combat environment, consider the following scenario:

It is the year 19_____, somewhere in northern Germany. LTC Hill, commander, TF 2-11, 25th Armored Division, is studying a tactical map with great concern. TF 2-11 is to be the right flank of an attack conducted by the 25th Armored Division to secure the important trade center in Bremen. Intelligence has determined that critical supplies of ammunition and petroleum are presently stockpiled in the city. The capture of these supplies would reduce the combat effectiveness of threat units operating in northern Germany. The attack is to be a fast-moving advance to the objective. Two air cavalry troops are assigned the mission of screening the TF/Division right flank and will give early warning if a critical threat develops in this area. Line of departure time for the attack is 0600 hours. A Troop, 2/23, is to be onstation to screen first. B Troop, 2/23, is to relieve A Troop in place at 0730 hours. A Troop will rearm/refuel and the mission will continue in this manner until the ground units secure and consolidate the objective.

It is 1900 hours the day before the planned attack. Captain Smith, commander of B Troop, 2/23, climbs tiredly from the cockpit of his OH-58. His troop has just completed a zone reconnaissance mission which began at 0600 hours this morning. Enemy activity has been heavy; although no aircraft have been lost, his crews are bone tired. The operation consumed large quantities of ammunition and fuel, and the forward area refueling/rearming point (FARP) personnel are dragging. Captain Smith has received the operations order for the screen the following day. At 2030 hours he briefs the mission to his personnel. Due to the condition of his crews and the FARP personnel, he elects not to rearm/refuel or preflight his aircraft until 0500 hours the following morning, in order to give the people a chance to rest. He feels there will be plenty of time to relieve A Troop onstation at 0730 hours.

The following morning at 0600 hours, TF 2-11 armor crosses the line of departure with A Troop screening the right flank. All is going according to plan. LTC Hill is in his M-1 tank monitoring the attack on the radio. From all reports the attack is going well. LTC Hill's concern over his exposed right flank is almost gone. The Air Cavalry unit has that mission well in hand.

Meanwhile, at B Troop FARP, Murphy's Law is playing havoc with the rearming/refueling process. A major factor hindering B Troop is that a number of FARP members have become very sick due to food poisoning and they are off line. This lack of personnel has doubled the rearming/refueling time. The aircrews have attempted to fill in; this has extended the time for preflight and pre-combat checks.

At 0745 hours, Captain Jakes, commander, A Troop, is becoming concerned about fuel for his aircraft. He has already released four of his Cobras and two of his scouts to rearm/refuel. His other four OH-58s must depart for the FARP, or they will be out of fuel soon. However, Captain Jakes realizes that he cannot leave the screen line without relief by B Troop.

At 0750 hours, LTC Hill is told that A Troop has had to leave the screen line for rearm/refuel but that B Troop, for some reason, has not relieved A Troop as previously planned.

At 0755 hours, a threat reconnaissance element advances to the exposed right flank of TF 2-11. From a concealed position, the threat element observes the M-1 tanks and M-3s as they move forward on the attack. At 0830 hours, the lead battalion of a motorized rifle division attacks TF 2-11's exposed flank.

LTC Hill's first indication that something is wrong is a radio transmission from a company/team that is being overrun. His next indication is a Sagger hitting his M-1.

Captain Smith and B Troop depart the FARP at 0740 hours. The radio traffic from TF 2-11 Armor is confusing and chaotic. It doesn't sound like a smoothly executed attack. On reaching the TF 2-11 area to take the screen line, Captain Smith observes at least 12 smoking M-1s. He unmasks his OH-58 to look over a ridgeline and sees what appears to be at least a motorized rifle battalion coming at him and the Division's right flank. He then hears a spot report from another scout that at least one-half of a threat battalion is even farther advanced and is attacking the ground element to TF 2-11's immediate left flank.

The TF 2-11 is no longer combat effective!

In the above scenario, the B Troop commander did not keep his unit in a 100 percent mission-ready posture. By not refueling/rearming immediately after a mission, he gave his unit a short-term morale boost at the expense of a division mission.

The tactical evaluations conducted by DES have shown that many units are unable to meet mission timetables.

Army Aviation, to be the valuable combat multiplier that it can be, must be at the right place *at the time determined* by the ground commander. Combined arms means just that: all combat arms fighting as one with a common purpose, thus capitalizing on the synergistic effect that accrues.

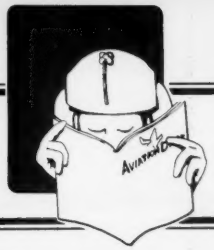
We need to ensure that we're *on time* to contribute to the combined arms and to control our dimension of the AirLand Battle.

Our actions during training must be honed to the precision needed in battle. We have to train as we intend to fight; with a sense of urgency and safety; *timeliness* must be among *every* aviator's highest priorities.

The Aviation commander needs to enforce this standard and lead by example; the combined arms team must operate with precise timing.

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362; or call us at AUTOVON 558-3504 or commercial 205-255-3504. After duty hours call Ft. Rucker Hot Line, AUTOVON 558-6487 or 205-255-6487 and leave a message

VIEWS FROM READERS



Editor:

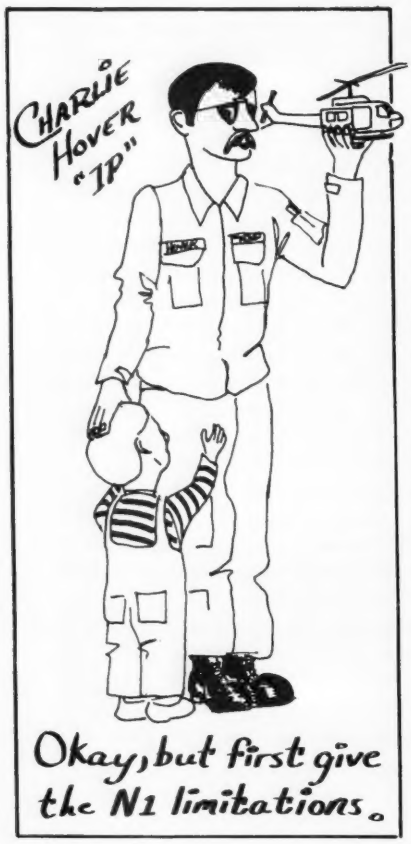
I found Major Westerhoff's article "Army Aviation Avionics," June *Aviation Digest,* quite interesting and informative. It depicts the history of avionics development with some unusual and little known side-lights. However, his reference to and description of the low frequency radio range requires clarification and some correction. As an "old timer" who was trained in and made many instrument approaches using the radio range *and* the NDB (non-directional beacon), I recall that they were adequate systems for instrument flight and approaches using the aircraft of that era. As a matter of fact the NDB instrument approach is still widely used today. Some additional comments on the subject:

- The Radio Range and the NDB were two different systems. The Radio Range required the use of a receiver only, while the NDB required a receiver and a loop antenna which was operated manually or automatically.
- The author's statement that, "The NDB transmitter consisted of two antennas each transmitting a different frequency," is an attempt to describe a Radio Range, not an NDB. Furthermore, both antennas transmitted the same frequency.
- Radio Range procedures were available for orientation, en route, holding and approach to the airfield. Approach minimums were often as low as 400 and 1.
- Whether or not the pilot required extensive training to use the system effectively is a matter of interpretation of standards adopted by operational units. As a matter of record, "Aviation Cadets" were required to qualify in the use of Radio Range and NDB procedures before graduation from flight school.
- The Radio Range was the first and only reliable system of radio navigation available to military pilots and commercial airlines, and remained operational for several decades. The system employing vibrating reeds was tested but was never brought to operational status.

AF Manual 51-37, 15 November 1960, contains an excellent description and history of the Radio Range.

I enjoyed the article and agree with the author that "the ideal is to have a truly all-weather capability that allows the commander positive control and the aviator the edge to fight outnumbered and win" *under all meteorological conditions.*

CW4 Michael J. Novosel
6th Bn, Ft. Rucker, AL



Editor:

The following poem appeared in the May *Aviation Digest.*

Because I Fly

I laugh more than other men,
I look up and see more than they,
I know how clouds feel,
what it's like to have
the blue in my lap,
to look down on birds,
to feel freedom in a thing
called the stick.
Who but I can slice between
Gods billowed legs
and feel them laugh and
crash with His step.
Who else but I have seen
the unclimbed peaks,
the rainbow's secret,
the real reason birds sing.
Because I Fly
I Envy No Man On Earth.

The poem was written by CPT Brian Suhl, USAF, Ret. He wrote this and other selected works while recovering in the burn ward at Brooke Army Medical Center. Brian Suhl now lives in Boca Raton, FL.

CW3 (P) Russell D. Capps
FWMEQC 83-8
Ft. Rucker, AL

Editor:

In regard to your article, "You Can't Hardly Tell It From The Real Thing," on simulators, I would like to say I've picked up some new things to do in the SFTS.

I would like to add one other thing that we do here at D Troop, 1/9, 1st Cav., Ft. Hood, TX. We schedule all four SFTS cockpits to practice formation IMC breakup and recovery with

ATC, including local VHIRP and cross-country procedures. We have all the cockpits positioned at the same place and the pilots are told when to press continue. After a few seconds in flight, flight lead declares IMC and procedures are followed until all aircraft have finished their approach. If one cockpit is finished before the others, it is given missed approach with holding instructions until the others are finished. Then they are repositioned and started again. The first time, usually, a few mistakes are made but by the time the 2-hour period is over everybody has flown all chalk positions and any problems have been ironed out. At the end of the period the tapes are run back, then viewed by the pilots. We have done this for the last year and a half with very good results.

CW2 Lonny Coots
Inst. UT
D Trp. 1/9 ICD

Editor:

I am an OH-6A and OH-58C pilot who is attempting to compile all available published data regarding loss of tail rotor control.

I found the article "OH-58 Tail-Rotor Control Power" in March 1983 *Aviation Digest* extremely informative.

As a unit trainer in the 28th Avn Bn in the Pennsylvania Army National Guard, I would like to request the following to use in my presentations to prospective students.

- *FlightFax,* Vol. 6, No. 46, dated 13 Sep 1978, subject: "OH-58A Tail Rotor Stall."
- *U.S. Army Aviation Digest,* Sep 1977, "How To Crash By The Book."
- *U.S. Army Aviation Digest,* Nov 1978, "OH-58 Tail Rotor Stall."
- *U.S. Army Aviation Digest,* Jun 1980, "Tail Rotor Breakaway."
- U.S. Army Safety Center Message 241925Z Oct 1978, subject: "Inadequate Tail Rotor Thrust in OH-58A Aircraft."
- *U.S. Army Aviation Digest,* Dec 1982, "OH-58 Power Droop."

If you could send me a copy of these articles I would deeply appreciate it and find them most useful.

CW2 Glen J. Lang
PAANG

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MONTHLY WRITING AWARD

Due to an increase in responsibilities and lack of training, many aeroscout observers are not qualified to perform their assigned tasks adequately to comply with AirLand Battle concepts. Special emphasis should be given to improving skills of the enlisted aerial observers to ensure that they receive the best possible training available to satisfy their roles in the combined arms team.

Aeroscout Observers Need Better Training

CW3 Michael C. Wyman
Standardization Instructor Pilot
HQ, U.S. Army Readiness and Mobilization
Region V
Fort Sheridan, IL

DURING THE PAST decade aeroscouts have evolved from target locators in Vietnam into minitactical operations centers. Today they are responsible for reconnaissance, security, coordination, control of fire and maneuver, and command decisions that significantly influence the outcome of battle.

The aeroscouts' vital role in the combined arms team is expanding as planners emphasize AirLand Battle concepts. Because of their expanded responsibilities, the aeroscouts' workload has drastically increased.

Aeroscout pilot training has begun to satisfy the requirement for additional skills, but the second crewmember, the enlisted aerial observer, has been almost totally ignored. Frequently, today's aeroscout observers are not qualified to perform their assigned missions. The general solution is obvious: The Army needs better training for aeroscout aerial observers.

In this article the term aeroscout refers only to those aerial observation assets assigned to air cavalry and attack helicopter organizations. Current and projected aircrew authorizations are for one pilot and one enlisted observer per cockpit. Field Artillery aerial observers, having a different mission and crew allocation, are not addressed.

Aeroscouts are vital members of the combined arms team because of their many responsibilities in air cavalry and attack helicopter organizations. Air cavalry units extend the commanders' capacity for reconnaissance and security, while attack helicopter units provide them with highly maneuverable antiarmor firepower. With the emergence of AirLand Battle doctrine, these units in particular have increasingly important roles in the combined arms team.

The aeroscout is the primary element of the air cavalry troop. According to FM 17-95, "Cavalry," the basic tasks of air cavalry are reconnaissance and security. Reconnaissance is the gathering of information relevant to specific zones, routes and areas and includes surveillance, which is systematic observation. Security operations provide reaction time, maneuver space and information about the enemy to the main body commander. Security operations, of which surveillance is an important part, include screen, guard, cover and area security missions.

Aeroscouts are the air cavalry troop's principal reconnaissance elements. For its reconnaissance mis-

GLOSSARY

AAPART	Annual Aviator Proficiency and Readiness Test
ATM	aircrew training manual
CDRUSAEIGHT	Commander, Eighth United States Army
CINCUSAREUR	Commander in Chief, United States Army Europe
CMF	career management field
FLOT	forward line of own troops
FM	field manual
MOPP	mission oriented protection posture
MOS	military occupational specialty
NBC	nuclear, biological and chemical
NOE	nap-of-the-earth
NVG	night vision goggles
SQT	skill qualification test
TC	training circular
TOE	table of organization and equipment
TRADOC	United States Army Training and Doctrine Command
USAARL	United States Army Aeromedical Research Laboratory
USAARMC	United States Army Armor Center

sion the troop has two information gathering groups, the reconnaissance platoon and the aeroscout platoon. The former is capable only of limited ground reconnaissance and is seldom employed separately; whereas, the latter can operate independently or in conjunction with other assets. Additionally, the aeroscout platoon's mobility and flexibility make it tremendously more efficient than ground reconnaissance elements.

The aeroscout is the focal point for the air cavalry troop's security mission. The troop's usual role in security operations is that of screening, either independently or in support of another unit's security mission. A screen, which provides early warning and counters enemy reconnoitering activities, requires visual surveillance to establish enemy contact and integration of firepower to destroy threat reconnaissance elements. The aeroscout is the obvious choice for conducting that surveillance. The aeroscout is also in the best position to coordinate indirect fires, close air support and attack helicopter fires to neutralize hostile reconnaissance efforts.

Aeroscouts are also key members of the attack helicopter company team. According to FM 17-50, "Attack Helicopter Operations," attack helicopter units are organized to destroy armored and mechanized forces. The attack helicopter, of course, provides that destructive firepower, but the aeroscouts have an important behind-the-scenes role. Prior to actual engagement, aeroscouts coordinate with the ground commander, determine the friendly and enemy situations, acquire targets, render reports, select battle positions and assist attack helicopter movement into those positions. During the engagement, aeroscouts hand off targets to attack helicopters, provide local security, and coordinate artillery and close air support as necessary. Although aeroscouts are generally unarmed, they are the primary coordinators for bringing death and destruction upon the enemy.

Air cavalry and attack helicopter organizations have increasingly important roles in the combined arms team. AirLand Battle doctrine emphasizes speed, flexibility, initiative of junior leaders and deep attack more than ever before. Army Aviation has traditionally amplified these capabilities for the ground commander, and will be asked to do so even more.

As the foregoing discussion has shown, aeroscout performance will directly influence the extent to which air cavalry and attack helicopter units accomplish their respective missions. Poorly trained aeroscouts will perform inadequate reconnaissance, provide insufficient security and bring uncoordinated firepower on the battlefield. Under the demanding AirLand Battle concepts we can't afford degradation of any combat asset; each must perform to its maximum potential.

Aeroscout crewmembers have an extremely heavy workload. Sophisticated air defense weapons necessitate nap-of-the-earth flight, which demands the crew's constant vigilance for flying and navigating. Nevertheless, the tactical missions addressed earlier also require considerable attention to be successful.

Safely operating the helicopter is a full-time job for the pilot. According to TC 1-137, "Aircrew Training Manual For Observation Helicopters," NOE flight is "flight as close to the earth's surface as vegetation or

obstacles permit. Airspeed and altitude are varied as influenced by terrain, enemy situation, weather and ambient light. NOE flight is employed in such a manner as to use terrain, vegetation and manmade objects to enhance survivability by degrading the enemy's ability to detect or locate the aircraft. It is used in the vicinity of the [FLOT]." In NOE flight, the aircraft is constantly near a variety of possible flight hazards including trees, poles, wires, fences, buildings and birds to name a few. Pilots must manipulate the flight controls with both hands and feet while continually directing their attention between cockpit instruments and the outside environment, often maneuvering the helicopter less than 1 meter from obstructions. A study of aeroscout crew workloads in May 1981, concluded:

"NOE Flight Tasks, performed either singly or in combination, will consume approximately 85 to 90 percent of the aeroscout pilot's available time. The USAARL Visual Performance/Workload studies indicate that the aeroscout pilot will only be able to devote approximately 10 to 15 percent of his available time to either assist the observer or perform any of the [mission tasks]."

Navigation during NOE flight is a full-time job for the aerial observer. Experience indicates that the crew's navigational success directly affects its degree of mission accomplishment. Faulty navigation can cause misorientation, resulting in costly mission delays and even detection and destruction by the enemy. Moreover, aerial navigation during NOE flight is characterized by relatively high airspeeds for the associated restricted fields of view, constantly changing headings and velocities, and a horizontal visual perspective of terrain features depicted on the map from a vertical viewpoint. Therefore, accurate NOE navigation is not only critically important from a mission standpoint, but it is also considerably more difficult than navigation in any other mode of flight. Research conducted to determine the visual workload of navigators during NOE flight revealed that 92 percent of their time is used in actual navigation tasks.

Performing reconnaissance, security and battlefield coordination frequently become other full-time tasks for the aeroscout crew. The observation helicopter ATM lists several individual tasks that are included in the general realm of NOE flight and NOE navigation. Beyond that, it lists several more tasks that specifically relate to reconnaissance, security and battlefield coordination. These additional tactical, special and mission tasks vary in complexity and duration; but, in almost all cases they must be performed by either the pilots or observers while those crewmembers are engaged in their primary duties—flying or navigating. Also, tactical situations often arise which demand performance of tasks simultaneously, complicating an already heavy crew workload.

Typical enlisted observers do not receive quality training in preparation for their aeroscout responsibilities. After completing the approved service school, which teaches those skills required of a ground scout observer, they are awarded MOS 19D10, Cavalry Scout, level one. The cavalry scout service school concentrates its efforts on ground observer training since most of its graduates are assigned to armored, mechanized and armored cavalry units. Aviation specific skills aren't even included in the cavalry scout's SQT task list. Some of the lower skill level ground scout capabilities are equally useful to aerial observers. But other skills critically needed by the aeroscout, such as planning and conducting reconnaissance, controlling techniques of movement and controlling platoon fires, are not required of the 19D until skill levels three and four. Unfortunately, only cavalry scouts in skill levels one and two are authorized in any quantity to fill aerial observer positions. As mentioned, TOE units are not designed to conduct extensive aerial observer qualification training. Since the school-trained cavalry scout receives no formal aviation instruction, current policy places the burden of initial aeroscout qualification on the gaining air cavalry or attack helicopter unit commanders. The peacetime mission of combat units is to train; but TOE unit training is the type that either maintains or improves an already acceptable level of readiness. Although FM 17-35, "Aeroscout Procedures," outlines a complete program of instruction, quality aeroscout training demands resources that unit commanders may not have. Shortages in qualified trainers, aircraft flight hours, training materials, on-the-job training time and available man-hours are only a few of the resource handicaps a commander may have to overcome. These same shortcomings prompted the Department of the Army to lift the responsibility for initial pilot aeroscout training from unit commanders; that mission now belongs to the Aviation Center at Ft. Rucker, AL.

The authorized aeroscout crew is usually inadequate to complete required mission tasks. The crew, comprised of one aviator and one enlisted observer, rarely accomplishes its goals. Instead, many commanders today routinely employ two aviators in each aeroscout helicopter, enhancing flight safety and mission performance *but weakening sustainability.*

One aviator and one enlisted observer are often overloaded on a typical aeroscout mission. As cited, aeroscout crewmembers have a very demanding workload. Since both pilot and observer spend about 90 percent of their time flying and navigating respectively, each has only 10 percent remaining time in

which to accomplish the entire aeroscout mission. Only a professionally trained and highly qualified crew can even begin to satisfy the wide scope of mission responsibilities.

This author's opinion, based on previous experience, is that few, if any, enlisted observers can satisfactorily perform or even comprehend the extensive array of aeroscout mission tasks. In fact, many enlisted observers possess only minimal NOE navigational skills, requiring them to focus all their attention on the navigating task. This all too common circumstance forces the pilot to perform all mission tasks virtually unaided, and either mission accomplishment or flight safety is jeopardized.

Two qualified aviators per aircraft are often needed to satisfy mission requirements. Today's aeroscouts, unlike their Vietnam era predecessors, are responsible for many on-the-spot battlefield decisions and a tremendous amount of combined arms firepower. The aviation battle captains are usually aeroscout mounted commissioned officers, and they are responsible for their team's fire, maneuver and fire support coordination. Should the battle captain become incapacitated or separated from his team, current doctrine calls for the next designated aeroscout to assume that role. Observers must be qualified to develop and direct their own plans for fire and maneuver, and their ability to employ all fire support assets must be credible to the supported ground commander. Enlisted observers are not trained to fulfill these obligations.

Beyond mission requirements, two aviators are often needed in each cockpit to enhance aircraft survivability. AirLand Battle forces must be able to fight in a variety of environments, including limited visibility and NBC. Night missions with or without NVG, flight in NBC conditions requiring MOPP and NOE operations are tasks which aggravate an already stressful combat situation. A single pilot subjected to such stress becomes prematurely fatigued, and the probability of catastrophic pilot error significantly increases. Besides relieving pilot fatigue, a second aviator can assume control should the pilot either become incapacitated or attempt to maneuver the aircraft on a collision course with an undetected obstacle.

The need for two aviators in each aeroscout helicopter is generally recognized worldwide. Although authorization documents allow for only one pilot and one enlisted observer per aircraft, as stated earlier, many commanders today opt for two aviators in each cockpit. Evidently, the degradation of mission sustainability is deemed an acceptable tradeoff for superior mission performance in peacetime. In prolonged combat operations, however, the associated fatigue related attrition may prove to be undesirable.

In April 1982, TRADOC tasked the Armor Center at Ft. Knox, KY, the Army's proponent for aeroscout matters, to conduct a study and identify the requirements for aeroscout observers. The final report recommended replacement of enlisted aerial observers with warrant officer aviators in air cavalry and attack helicopter units. Input for the Armor Center study, as well as other sources, indicates that the Army Safety Center, Army Soldier Support Center, and the Army's commands in Europe and Korea all support the two-aviator position.

Since aeroscouts are key members of the AirLand Battle team and have enormous workloads, their training should be the best available. Obviously, a crew of two aviators has a combined level of training much higher than that of the present crew. Within the aeroscout community the predominent opinion is that only the authorization of two aviators per cockpit will provide acceptable levels of mission performance, combat sustainability, aircraft survivability and flight safety. Why, then, has this policy not been adopted? Apparently, the major objection for replacing enlisted observers with warrant officer aviators today is based on fiscal limitations.

An alternative to authorizing more aviators is that of institutionalized aeroscout training for enlisted observers. But, many problems, such as possible development of a new CMF, selection criteria, prerequisites and career progression, must be resolved.

The specific training syllabus is probably the most controversial issue. Since the current enlisted observer is usually inadequate from a mission standpoint, the alternative observer must be able to independently manage any battlefield situation. The pilot's workload is then reduced to operating the helicopter and making all final mission decisions.

Limited flight training for the observer is another area of disagreement. Observers able to take control of the aircraft would certainly enhance flight safety. Furthermore, should observers so trained be subject to the enlisted SQT system, or should they receive annual evaluations similar to the aviator's AAPART? Finally, will the cost of this extensive minimum training closely parallel that of aviator training?

These and many other related questions must eventually be addressed. The enlisted aerial observer is a holdover from the Vietnam era when the aeroscout's entire mission was to locate targets for attack helicopters. Since then aeroscout responsibilities have increased dramatically, but observer training has only received limited attention.

Only highly qualified crewmembers can possibly achieve maximum aeroscout potential so vital for the success of the AirLand Battle.

illustration courtesy of General Dynamics

The AirLand Battle

A Winning Combination

The AirLand Battle doctrine calls for "deep attack." In this short *treatise, the author suggests a change in targeting priorities and a reorganization of the combined arms team in order* to direct our strength at the enemy's weakness and *create vulnerability we can exploit.*

Lieutenant Colonel
John G. Heslin

The opinions expressed in this article are those of the author and do not necessarily reflect the views of any Department of Defense agency.

THE AirLand concept is not a futuristic dream to remain on the shelf until all new systems are fielded...corps and divisions can and must begin to learn and practice fighting the AirLand Battle now...." These words from TRADOC Pamphlet 525-5 provide the impetus for gaining a clear understanding of what the AirLand Battle is and provide a challenge for some critical thoughts as to how we might best apply the concepts associated with it.[1]

Current doctrine embodied in the AirLand Battle is oriented toward gaining and maintaining the initiative through offensive action and "deep attack." The concept of being outnumbered and fighting to win appears, at first glance, extremely difficult if not impossible. We are told we must defeat the first echelon forces and throw the enemy's offensive machine off balance by striking deep into the second echelon. The overwhelming enemy mass must be defeated through timely application of effective fire. Unfortunately, the size of their mass quickly leads us to the conclusion that only high-value fire (nuclear fire) would be effective. We are dominated by the statistics, and any hope of striking a favorable balance at the conventional level seems unlikely at best.[2]

There is, however, a possibility that a change of target priorities and the tactical employment of our combined arms team could offer a combination more likely to succeed at the conventional level as well as in the nuclear/chemical environment of the integrated battlefield.[3] What I am suggesting is a reevaluation of the attrition strategy that pits strength against strength and matches tank for tank. Rather, let us exploit the strengths of our weapon systems by taking advantage of our enemy's vulnerabilities. Let's use our assets to attack the more vulnerable elements of their combined arms team to create an imbalance for them which we can exploit through offensive action.

The combined arms team is essentially a mix of fire and maneuver forces with various weapon systems providing the preponderance of either the fire or maneuver characteristics of combat power. Generally, tank-heavy armored formations dominate the maneuver forces on the modern battlefield. Threat doctrine is firmly grounded in the dominant role these forces play in offensive operations designed for deep penetration and overwhelming mass. Heavy fire is provided by the large number of artillery tubes and multiple rocket launchers (MRLs) located well forward to support the deep thrust. Aerial systems project fire deep into the main battle area and beyond.

Current U.S. doctrine tends to match our armor against theirs and our artillery fire against theirs in counterbattery fire. Complex combat effectiveness models have shown that slugging matches such as this lead to outcomes favoring

[1] TRADOC Pam 525-5, "The AirLand Battle and Corps 86," Department of the Army, Headquarters, U.S. Army Training and Doctrine Command, Ft. Monroe, VA, 25 March 1981, p.4.

[2] The current proliferation of quantitative models and the American penchant for them has, in my opinion, established a dangerous trend. An overreliance on quantitative models, especially in force planning and policy making, may set us up for a "paper defeat" which could lead to a moral defeat. The determination implicit in F.W. Lanchester's work remains with us today. See F.W. Lanchester, *Aircraft in Warfare: The Dawn of the Fourth Arm* (London: Constable and Company Limited, 1916), p. 38.

[3] For a comprehensive presentation of the integrated battlefield, see Reference Book 100-34, "Operations on the Integrated Battlefield, U.S. Army Command and General Staff College," Ft. Leavenworth, KS, March 1981.

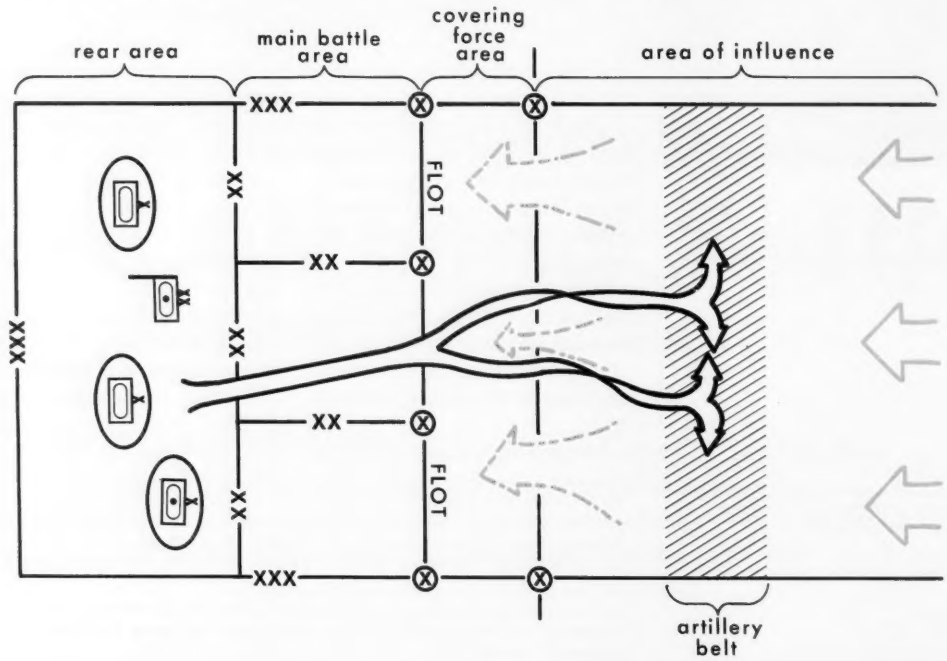
quantitative superiority.[4] However, more favorable outcomes may result from a different combination of forces.

Threat artillery located well forward may be the key vulnerability to exploit in the initial phase of the battle. If the effective fire of these weapons can be denied the attacking forces early-on, we may unbalance their combined arms team which will create additional vulnerabilities to exploit. The question is, of course, how to most effectively accomplish this task. As already mentioned, counterbattery fire requires forward positioning of our artillery which increases its vulnerability and leads to costly exchanges. At some later date, our MRLs may add their weight to this crucial task.

What I suggest here is that aerial platforms, both Air Force and Army, have enemy artillery as their first priority for attack. The combination of a high-low mix of aircraft operating as a high speed penetration into the enemy "artillery belt" may well be the key to silencing their guns. Flight corridors for the attack should be selected to avoid the intense air defense artillery (ADA) of the enemy's main battle formations. High speed, low level approaches over wooded or untrafficable terrain supported by suppressive fires would enhance success of the penetration. Flechette and high explosive 2.75 inch rockets would be effective against the relatively exposed targets in the artillery belt. TOWs (tube-launched, optically-tracked, wire-guided missiles) could destroy high value point type targets. Weapon signatures would facilitate locating firing batteries. Air Force systems could engage enemy air and provide ADA suppression while attack

[4] For examples of various computer models, see Reiner K. Huber, Lynn F. Jones and Egil Reine ed. *Military Strategy and Tactics: Computer Modeling of Land War Problems* (New York: Plenum Press, 1974). For an excellent example of a quantitative model, read T.N. Dupuy, "Application of the Quantified Judgment Method of Analysis of Historical Combat to Current Force Assessments," in *Military Strategy and Tactics*, pp. 133-151. A critical analysis of the current modeling techniques is provided by J. A. Stockfisch, *Models, Data and War: A Critique of the Study of Conventional Forces*. The Rand Corporation, Santa Monica, CA. March 1975. "Indeed, on the subject of force structure, the new firepower indexes, and models that use them, should be silent because they have nothing to offer," p. 78.

FIGURE 1: High-low aerial attack teams bypass heavy formations to strike artillery belt.



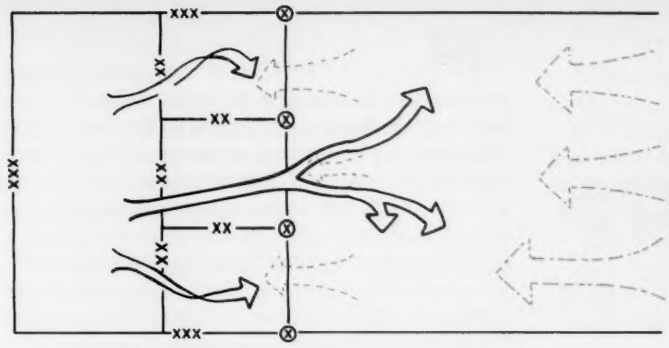


FIGURE 2: Armor heavy reserve conducting deep attack through first echelon gaps strikes follow-on units and prepares to meet second echelon as aerial attack teams strike disorganized enemy in the main battle area.

helicopters strike artillery and support units. Recovery elements consisting of security and maintenance teams would accompany the aerial deep attack forces.

The symbiotic relationship of the high-low mix should enhance the effectiveness of the team and allow it to seriously disrupt, if not totally deny, effective fire support for the attacking threat forces. This combination would allow for the preponderance of friendly artillery to be positioned well back, out of range of most threat fires. The majority of friendly artillery would be firing at max range out to 5 km beyond the forward line of own troops. The weight of their fires would be concentrated in support of action in the main battle area. Primary weapons systems for the destruction of enemy armor in the main battle area would be precision guided munitions/missiles (PGMs) and mines. Deep penetration by some enemy armor, though considerably disorganized, must be expected. Destruction of these machines by infantry units armed with PGMs will be facilitated by the decreased volume of enemy artillery fire and availability of responsive fire support.

FIGURE 3: AirLand Battle priority for attack.

Armor heavy reserves will then be capable of effective counterattack and deep thrust through gaps in the enemy first echelon forces.[5] Follow-on support and command and control organizations will be the targets for these attacking units. Paralysis and destruction of the enemy offensive machine will be their objective. The high-low aerial attack teams could then shift their priority from the artillery belt to the disorganized enemy forces in the main battle area.

This combination of striking the enemy artillery belt by a high-low mix of aerial attack teams, reduced vulnerability of friendly artillery, destruction/disorganization of threat armor by infantry PGMs and mines, and armor heavy reserves prepared to exploit opportunities for deep thrust at vulnerable follow-up units offers the possibility of directing strength at weakness and providing a winning combination in the AirLand Battle.

[5] For an interesting discussion of this concept, see *Generals Balck and Von Mellenthin on Tactics: Implications for NATO Military Doctrine*, BDM/W-81-077-TR, The BDM Corporation, McLean, VA, 19 December 1980.

ABOUT THE AUTHOR

Lieutenant Colonel John G. Heslin is with the Unit Training Directorate, U.S. Army Logistics Center, Ft. Lee, VA. He received a B.A. from Providence College, an M.A. from the University of Rhode Island and is a graduate of the Command and Staff Course, Naval War College. He has served in various aviation command and staff positions in the continental United States and Vietnam. His article "Mobility: Key to Success on the Extended Battlefield" appeared in the August 1981 *Military Review*.

Additional articles include, "Read For Personal Growth, Professional Development" in *ARMY*, August 1981, pp 60-61, and "Consider the Balloon" in *Aviation Digest*, December 1981, pp 31-33.

AIR TO AIR

Pigs and Rice in the OK Corral

Captain Kevin G. Scherrer
A Co, 503d Aviation Battalion
APO New York

MUCH ATTENTION has been devoted recently to the probable air-to-air combat among helicopters in the next conflict. Naturally, most of this attention has been focused on the future Hind-Cobra duels and the "Battle of Britain" scenarios which they generate. Let's not forget, however, that there are other friendly helicopters operating out there near the FLOT that must be considered. You know the ones: the whales, the wide-bodies, the fat-scouts—the mild-mannered, slightly antique and (gulp) undergunned UH-1 Hueys. With M60s blazing, our Hueys probably couldn't defend themselves against a moderately armed Hoplite, let alone a Hind-D. The currently available solutions to this situation are not too numerous, but the failure to recognize them and to search for new ones might one day prove fatal:

20 May 1984, 1130 hours: Just what I need, another mission. Hey, Scooter! Is Bob coming? Oh well, guess I'll take notes for the two of us.

Here comes Captain Mackenzie, ready to lay it on us. Warning Order: cross FLOT (yikes)...insert a dozen combat engineers to blow bridges on Route 62.

Hey, don't they have an Air Force for this kinda stuff? Drop-off only (poor souls).

Potential Soviet MSR...no escort.

NO ESCORT? NO ESCORT PAST THE FLOT? Hey sir, what the hell kinda....

Yes, sir! Right, sir! Kill tanks, sir—three bags full, sir.

I don't like the sound of this one at all. Sir, can I fly the general this afternoon?

Let me see that map—routes don't look too bad.

Great, my fat mouth just earned me AMC honors. Where's my .38?

1205 hours: Chow. How I just love C rations. I hope the guy who invented these things starves to death. Spaghetti and meat balls? Doesn't anyone want to trade for a B-2 unit? Well, that figures. Thank God for sterno anyhow.

1245 hours: Aircraft prep. How'd I get stuck with seven-oh-pig anyway? No kit 1/A; only one fox-mike; and they still haven't covered up that zinc-chromate yet. Oh well, she flies nice and smooth at 120 knots so I shouldn't complain—still have 2,000 rounds of 7.62. Hey, Pete, don't forget to oil these guns before we go. Who's our other door gunner today?

GLOSSARY

ACP	air control point
ADA	air defense artillery
AGL	above ground level
AMC	airmission commander
APR-39	radar warning receiver
FLOT	forward line of own troops
KY	communication equipment
LAW	light antitank weapon
LZ	landing zone
MSR	main supply route
psi	pounds per square inch
RP	release point
TOW	tube-launched, optically-tracked, wire-guided
UHF	ultrahigh frequency

No escort, heh!

I've got half a mind to call up Charlie Company to see how many Snakes they've got committed. I hear those Hinds have been blowing Hueys out of the sky left and right down in VII Corps. At least Cobras have something to shoot back with.

1330 hours: Engineers arrive; what a scraggly bunch, but who can blame them. Naturally, their lieutenant still looks strike. Let's see: an E-7, E-6, two E-5s, seven ditch-diggers, and enough demolitions to bring down the Washington Monument.

1340 hours: Final mission brief by the AMC (me). Pre-chambered bridges. Primary LZ's about two klicks from the bridges, alternate about 3½ klicks. Looks OK from the map (should I tell them no escort?)...no chemical threat...downed aircrew recovery points...freqs...search and rescue....

1410 hours: Engineers check weapons, review ground plan.

1415 hours: Load-up, strap in and crank.

1425 hours: Commo check. KY is working great.

1430 hours: Takeoff (uneventful). Suck it in and we're on our way. ACP 1 and we're really truckin'. No business, still 20 klicks shy of the FLOT. ACP 2, the holiday's over. Artillery's all over the place, some really hurting ground units down there. Several Cobras heading west, probably for another load of TOWs.

APR-39 starting to glow...ACP 3, this is it: our FLOT: Vulcans left and right in the treeline. *Look* at all those BMPs and T72s—a few Hinds way up north, should be no factor; A-10s drawing all the ZSU fire. A few 12.7 rounds coming our way.

Chalk 2 is hit, but OK...hitting peacetime V...one pax just wet his drawers...quick map check (expletive deleted)...we're off course!

Follow those power lines to your right front until they cross the autobahn. Back on track now; *three Hips, 2 o'clock high, three klicks, taking cover, HOLD ON!* Quick decel into a tight draw. Oh, no: 55 psi; chalk up the kid's first combat overtorque...cross fingers and sweat it out. Three minutes of heavy hovering, a quick peek over the top and we're back in business.

ACP 4, last one before the RP...less flak, looking good.

RP; landing check is good, gunners alerted, engineers ready, LZ? *There it is!* Too much slope...5-foot hover and out they go (sorry guys). They're into the woods and we're on our way (sigh of relief).

ACP 6, still looking good, I can taste those hot A's for dinner.

What the—(two rockets pass by off right door)...quick, 30 degree left turn. Two Hinds about four klicks behind us and closing. What to do? Gotta think fast! Still too far from the Vulcans. Quick, call on UHF to the zoomies (too busy). *Lima24 (Cobras), this is Romeo48; request assistance, over.* No answer, damn. BOB! Another missile off the left side, this time too close for comfort; hard right turn, 49 psi, but they're still closing; in gun range soon.

Lead this is trail, I'm hit, running rough, possible fire, going down!

Only 3 klicks now to the FLOT; maybe I can reach the Vulcans. Cobras at 2 o'clock; can I get a call off? (Thump). Too late...(large explosion)...going down fast. Oh, God!

To attempt to lay down a new doctrine, or establish a firm set of "antihelicopter procedures" would be facetious. Not only is the author underqualified to do so, but also the data base to support any such theories is simply nonexistent. We are now in the "brainstorming phase," and the goal of this article is to stimulate the minds of all Huey drivers, to start generating ideas and suggestions (however unconventional or seemingly foolish) from which the experts can choose and improve upon. Sadistically, let us set the scenario at its worst: Unescorted UH-1s behind the enemy FLOT (perhaps with TOW teams going after the second echelon). A chance encounter with multiple threat helicopters (armed to the teeth naturally) will undoubtedly provide our AMC with the opportunity to exercise his flying skills, poise and ingenuity.

Once the engagement is made, our Huey crews will be faced with a myriad of considerations which will affect their course of action and its success. Probably first and foremost, we must make a quick assessment as to whether or not the enemy has established visual contact. If he has not, we'd best make the most of it:

mask, sweat it out and continue on. If he has contact, hold onto your seats, the fun is just beginning.

First off, what's his distance—we must make a quick but educated guess to determine how much time we've got before he's within gun/missile range. The amount of time we think we have before we're in his sights will weigh heavily on our choice of actions. We may or may not have the time to get a radio call off to (and a response from) supporting AH-1s or A-10s. Another consideration is the distance between our location and that of friendly ground or ADA units. The deeper we are behind the enemy's FLOT, the fewer options we have. The fact that we are a multiship formation might also influence our choice of actions (it is not necessarily every man for himself). And lastly, have we completed our mission? What are our chances of mission accomplishment? Will mission completion justify losing all of our aircraft and crews? Not an enviable decision obviously, but nonetheless one that is likely to arise.

Now that we've made all these considerations (probably within the span of several busy seconds), it's time for action. Unfortunately Ivan does have visual contact and is steaming toward an intercept point. Our first reaction is to head for friendly lines with their Vulcans and ground units, but if we're more than just a few klicks away, we'll never make it. Our rival has about 60 more knots of airspeed than we do; an attempt to outrun him may likely be in vain. Again, all this depends on the distance between the two aircraft and the distance from our FLOT. Some quick estimates and calculations will tell us if a beeline is our best answer.

One of the supposed advantages of the UH-1 over the Mi-24 Hind is its smaller size, which would lead one to think that we can outmaneuver it. Maybe, maybe not. Remember, in his own backyard, our adversary doesn't have to stay under 50 feet AGL, so while we're darting in and around treelines, he's simply cruising along above. Secondly, we must not only outmaneuver his aircraft, but also his chin turret and his air-to-air missiles. And even if we do outmaneuver him for a certain time period, where will all of this dogfighting lead us? On the other hand, some fancy flying (and perhaps a few sick passengers) may be the key to our survival if we can outmaneuver him so as to break visual contact before he can slave his guns, and maintain this loss of visual contact until he gives up the chase and returns to his original mission.

Reminding ourselves that we are still brainstorming, let's not neglect the alternative thought of fighting the Hind in an air-to-air mode. A quick review of comparative weapon systems (and perhaps a reflection on our last aerial door gunnery performance) would suggest that we might be outmatched. A six-ship formation might put out a crossfire that would make a Hind driver think twice. But in a one-on-one situation, the ball is clearly in his court.

One last and perhaps risky option merits consideration (remember: take it for what it's worth): If we are too far behind his lines to outrun him, too slow to outmaneuver him and too smart to try to shoot him out of the sky from the air, we can always land. *Yes, land and fight from the ground!* A last resort perhaps, but consider our chances if we can get down, get both M60s in a firing position and take out whatever other unauthorized armament we may have "requisitioned" along the way (a LAW, an M203 or maybe even a Redeye). Our odds on hitting Ivan as he passes over us might be pretty good (as long as he flies our flight path), and a successful belly shot may just save the day. If we don't hit him, we'd better get off the ground quickly and return to square one.

As one can see, a quick but accurate estimate of the situation, especially the relative distances between aircraft and friendly lines, is probably the most important step in air-to-air defense. An unescorted Huey without fast mover support will have to rely on its own armament and the flying skills of its crew for survival. The ingenuity with which we approach this difficult task, and the tenacity with which we practice potential solutions now are the essential elements of survival on our next battlefield.

U.S. Army Communications Command
ATC ACTION LINE

Maximum and Minimum IFR Altitudes

INSTRUMENT FLIGHT RULES (IFR) altitudes published on aeronautical charts which govern IFR operations on airways, routes or route segments in controlled and uncontrolled airspace for aircraft operations.

Maximum Authorized Altitude (MAA). A published altitude representing the maximum usable altitude or flight level for an airspace structure or route segment. It is the highest altitude on an airway, route or area navigation at which adequate reception of navigation and signals is assured.

(PACIFIC (PAA) ONLY)

NOTE: PAA AREAS—MAAs are established by national states to restrict flight above designated altitudes and are the highest altitude allowed along airways, routes or other direct routes.

Minimum Crossing Altitude (MCA). A published altitude representing the lowest altitude at certain navigational points which an aircraft must cross when proceeding in the direction of a higher minimum en route IFR altitude. A climb to the MCA prior to reaching the navigational point is mandatory.

Minimum En Route Altitude (MEA). A published altitude representing the lowest authorized altitude on airways, routes or segments thereof at which Department of Defense (DOD) aircraft may operate.

Published MEAs normally coincide with nationally established minimum IFR cruising altitudes. Exceptions are in areas where the nationally established MEA does not meet obstruction clearance criteria established by ICAO or DOD.

Where the nationally established MEA does not meet ICAO or DOD obstruction clearance criteria, a DOD MOCA, which only assures obstruction clearance 4.32 NM (5 SM) either side of the airway or route centerline, will be established and published in FLIP.

(EUROPE/MIDDLE EAST/AFRICA ONLY)

NOTE: MEAs are equal to or higher than MOCAs except in Spain, Iceland and Azores where nationally established MEAs are published by agreement. These MEAs are in no case lower than 1,000 feet above the highest en route obstruction within the airway limits.

(PACIFIC ONLY)

NOTE: MEAs within FAA jurisdiction (Honolulu Flight Information Region) assure acceptable signal coverage between radio navigation fixes. The MEA provides obstruction clearance of 1,000 feet in non-mountainous areas and not less than 1,500 feet in mountainous terrain 4 NM either side of the airway centerline.

(ALL)

NOTE 1: ICAO criteria provides a minimum obstruction clearance of 1,000 feet 4.32 NM either side of the airway centerline between radio navigational fixes.

NOTE 2: DOD criteria provides a minimum obstruction clearance of 1,000 feet in nonmountainous terrain and 2,000 feet in mountainous terrain (areas with elevations more than 3,000 feet) 5 statute miles either side of centerline between radio navigational fixes.

NOTE 3: Due to the lack of flight checks in some foreign areas, signal coverage along the entire route cannot always be assured.

Minimum Obstruction Clearance Altitude (MOCA). A published altitude on airways, routes or segments thereof between radio navigation points which assures clearance above the highest obstruction of 1,000 feet in nonmountainous terrain or 2,000 feet in mountainous terrain (areas with elevations more than 3,000 feet) within 4.32 NM (5 SM) of the airway or route centerline.

A DOD MOCA will be established when no nationally established MEA is provided or when the nationally established MEA does not meet ICAO or DOD obstruction clearance criteria. When no MEA is shown on the chart, the MOCA is the lowest authorized altitude that may be flown by DOD aircraft.

A DOD, MOCA, when lower than the MEA, may be shown in conjunction with the MEA to provide obstruction clearance information only.

DOD MOCAs are identified on DOD FLIP En Route Charts by an asterisk.

(ALL)

NOTE: Due to the lack of flight checks in some foreign areas, DOD MOCAs may not assure adequate signal within 22 NM of a VOR.

(U.S./CENTRAL AND SOUTH AMERICA/PACIFIC)

NOTE: FAA MOCAs established between navigational fixes on federal VOR airways, routes, route segments or off airway routes meet FAA obstruction clearance along the entire route segment and assure navigational signal reception only within 22 NM (25 SM) of a VOR.

Minimum Reception Altitude (MRA). The lowest published altitude required to receive signals to determine specific navigational fixes or intersections.

Readers are encouraged to address matters concerning air traffic control to:
Director, USAATCA Aeronautical Services Office, Cameron Station, Alexandria, VA 22314

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MAXFLY

Sample Data Collection Proves Itself Again

Mr. James McGraw
Product Assurance Directorate
U.S. Army Troop Support and Aviation
Materiel Development Command
St. Louis, MO

ON 6 MARCH 1982, General E.C. Meyer, Chief of Staff of the Army, initiated a concept that was to be called MAXFLY. Simply stated, the concept was to question whether Army aircraft were being maximally used. Was it, perhaps, possible to fly existing aircraft more hours, and thus meet increasing Army Aviation requirements? If the aircraft were flown more, would the additional cost to repair and maintain the aircraft outweigh the savings of not increasing aircraft fleet size?

On 15 April 1982, the U.S. Army Troop Support and Aviation Materiel Readiness Command (TSARCOM) was tasked to provide data to the MAXFLY program. MAXFLY would use two models to project maintenance and repair probabilities for several aircraft in Europe for fiscal years (FY) 1984, 1985 and 1986. TSARCOM would input the data to the Concept Analysis Agency (CAA) for assessment, and the CAA would submit its report to General Meyer.

TSARCOM fortunately had in house a sample data collection (SDC) system that was able to provide historical data on unscheduled maintenance on a representative sample of Army aircraft. TSARCOM used this historical data to project down time, given an increase in the flight hours.

Specifically, SDC provided data on the AH-1S, CH-47C, OH-58C, UH-1H and UH-60A aircraft. Data elements pertaining to number of removals, repairs, replacements, unscheduled maintenance actions, flight hours and maintenance manhours were used to compute parameters such as mean times between removals, repairs and replacements, maintenance action rates and manhours per flight hour. These parameters were themselves used to project probabilities such as the probability of repairs and probability of replacements. SDC also provided information revealing the effect of the unscheduled maintenance event on the mission, and how the problem was recognized. Probabilities of mission aborts were computed from this information.

All these computations were organized into blocks of data, such as a repair block, a replacement block and a test flight block, and then introduced into two models called TARMS and Overview, which simulated aircraft performance and thus provided information needed by General Meyer to help resolve the question: Is it cost effective to meet increased mission requirements by increasing fleet utilization?

SDC began input to MAXFLY by 1 September 1982, and by February 1983 TSARCOM submitted its data to CAA.

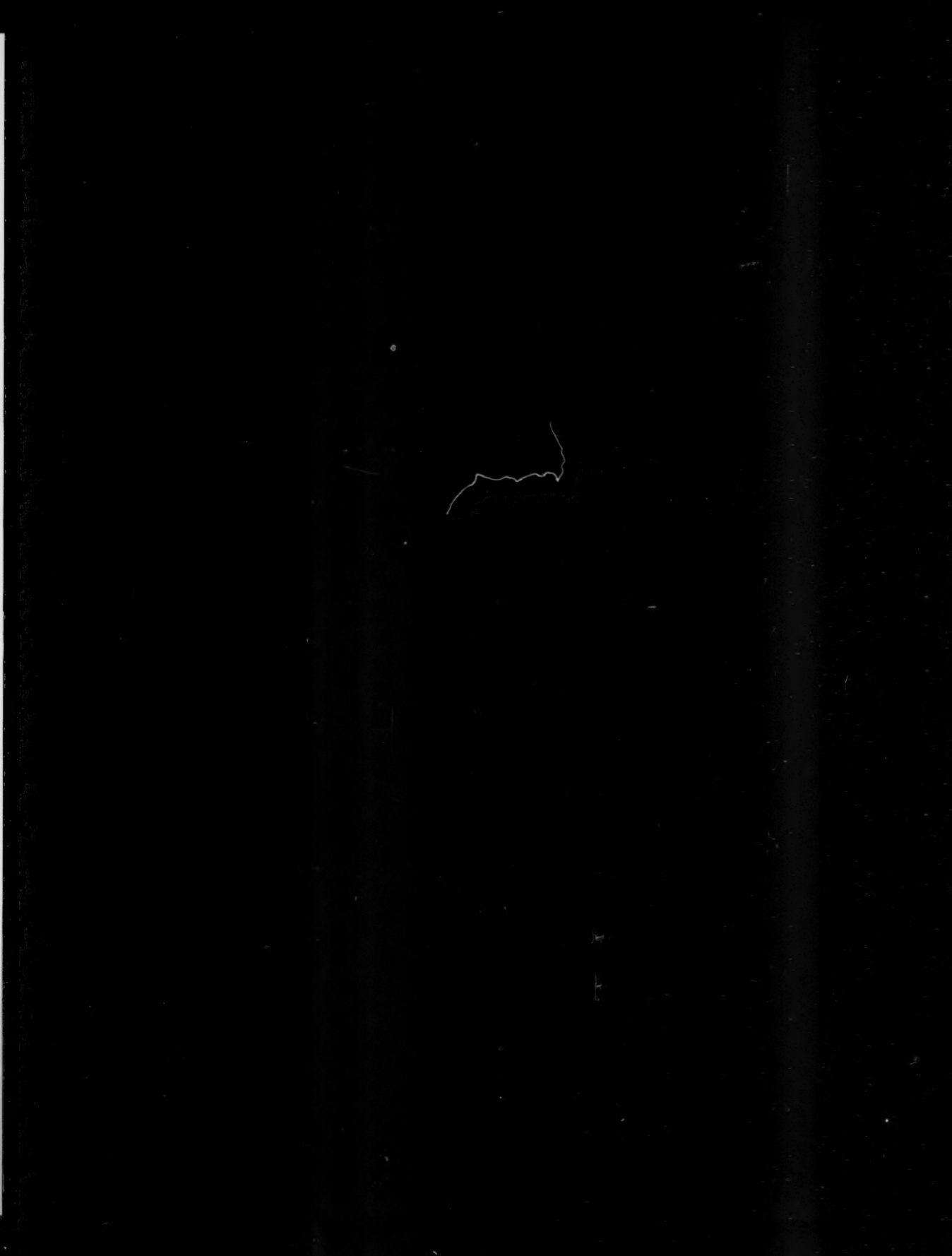
What has the MAXFLY experience taught us about SDC?

SDC could not anticipate the specific parameters that might be needed to feed a specific study such as MAXFLY. SDC was designed to be general enough so that basic data would be usable by various technical disciplines for their analyses. It came as no surprise, therefore, that SDC did not exactly meet all MAXFLY requirements. However, as SDC matures and is exposed to more users, it will become more responsive to varying data needs.

For future applications of SDC, some alteration in the data elements collected can tailor the system to meet specific user needs, but even with its shortcomings, SDC was able to povide usable data in a short time. The only alternatives to SDC would have been educated guesses from the engineers who work with the systems, or a study of draws on the supply system, which would have told nothing about failure probabilities.

What does SDC input to MAXFLY tell us about future applications of SDC?

There are two applications of SDC just on the horizon. The first is support of a MAXFLY study of the CH-47D (SDC now collects data on the CH-47B and the CH-47C). The second is support of a MAXFLY study of aircraft in a sand environment. There is, in the geographic distribution of the sample, some collection on aircraft in a sand environment; this could be expanded.

Generally, SDC has shown itself to be an accurate and quick response data system that is adaptable to the needs of many users. It can provide information to inventory models to estimate availability, or it can provide reliability and maintainability parameters for various models.

SDC input to MAXFLY has provided another view of the system's value and also given insight to areas that can be improved. As these improvements are made, the future of SDC will be far reaching and its usefulness in assessing the Army Aviation mission will be enhanced.